THE GAS JOURNAL

MARCH 2, 1932

Vol. 197 — 84th Year — No. 3589

A Glance at the Contents

Company Meetings and Results.

Reports are published of the annual meetings and results of a number of gas companies. [p. 556 *et seq.*]

Salesmen at the Fair.

A large number of salesmen attended the official visit of the Salesmen's Circles to the British Industries Fair at Birmingham on Friday last. [p. 534.]

Scottish Juniors at Meter Works.

On Feb. 13 the Eastern Section of the Scottish Junior Gas Association visited the New Grange Works of Messrs. Alder & Mackay, Ltd., Edinburgh. [p. 532.]

Juniors at the Fair.

Thursday last was chosen for the official visit of the British Junior Gas Association to the Birmingham Section of the British Industries Fair, when an address was delivered by Mr. J. H. Canning, President of the Institution of Gas Engineers. [p. 534.]

The Stourport Gas-Works.

An illustrated description (extracted from "West's Gas") is published to-day of the Stourport Gas-Works. Stourport has been associated with the Gas Industry almost from the beginning; in fact, soon after Murdoch built the first gas-works at the Soho Foundry, Smethwick. [p. 540.]

Ten Years of the Therm.

At the Joint Gas Conference at the British Industries Fair, Castle Bromwich, to-day, Mr. W. J. A. Butterfield, one of the Gas Referees, gives an address on the effects of the Gas Regulation Act of 1920 on the progress made in the Industry. [p. 542.]

Gas at the London Section of the B.I.F.

The Gas Industry is represented at the London Section of the British Industries Fair by the Gas Light and Coke Company and the South Metropolitan Gas Company, who have interesting stands in the Chemical Section at Olympia. [p. 536.]

Plant Yields and Estimated Costs.

In a contribution by Mr. Thomas Johnston, the author states that bye-product costing systems follow the crude material through the various plants until the finished product is reached. Unfortunately for the accountant, however, chemical works have an uncomfortable habit of carrying variable and often large stocks of intermediate products, and some method of calculating the probable yields from those intermediates must be devised if accurate costs for finished products are to be obtained. [p. 541.]

Attention is directed to the announcement on the loose inset included in the Home Edition of this issue of the "JOURNAL." The Supplement to Seymour's "Assessment of Gas Undertakings," and the complete new edition, will be ready for dispatch shortly, and orders can be accepted now at the "GAS JOURNAL" Offices. A review, by Mr. J. R. W. Alexander, M.A., LL.B., will appear in the "JOURNAL" for March 16.

Forthcoming Engagements

March 5.—SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT).—Visit to Fife Coal Company's Brownhill Colliery, Cardenden. Address by Mr. H. Rule.

March 5.—SCOTTISH JUNIOR ASSOCIATION (WESTERN DISTRICT).—Annual Business Meeting. Address by Mr. W. R. Cone, of the British Road Tar Association.

March 8.—INSTITUTION OF GAS ENGINEERS.—Finance Committee, 10.30 a.m.; Executive Committee, 11 a.m.; Education Executive Committee, 4 p.m.; 28, Grosvenor Gardens, S.W. 1.

March 8.—INSTITUTION OF GAS ENGINEERS.—Meeting of Joint Lighting Committee at 2.15 p.m.

March 9.—INSTITUTION OF GAS ENGINEERS.—Board of Examiners, 10.30 a.m.; 28, Grosvenor Gardens, S.W. 1.

March 9.—Joint Visit of MANCHESTER AND YORKSHIRE JUNIOR ASSOCIATIONS to Messrs. W. & B. Cowan's Victory Works, Stretford. Address by Mr. E. Butterworth.

March 10.—B.C.G.A.—Annual Meeting of Lancashire District, Manchester.

March 10.—MIDLAND ASSOCIATION.—Annual Meeting, Grand Hotel, Birmingham.

March 10.—MIDLAND JUNIOR ASSOCIATION.—Paper by Dr. F. S. Sinnatt, "A Consideration of the Properties of Coal Seams."

March 11.—B.C.G.A.—Annual Meeting of Yorkshire District, Leeds.

March 12.—WESTERN JUNIOR ASSOCIATION.—Meeting at Bristol. Paper by Mr. J. H. Bingham on "Dry Gas Meter Design."

March 15.—MANCHESTER DISTRICT ASSOCIATION.—Annual Meeting.

March 16.—B.C.G.A.—Annual Meeting of Northern District, Newcastle.

March 16.—MIDLAND JUNIOR ASSOCIATION.—Visit to Watson House, London.

March 17.—S.B.G.I.—Council Meeting in the afternoon.

March 18.—SOUTHERN ASSOCIATION. — General Meeting, Hotel Metropole, Northumberland Avenue, W.C., at 2.30 p.m.

March 23.—B.C.G.A.—Annual Meeting of Eastern District, Cambridge.

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Page 36, KESWICK. H. M. Tysoe appointed Manager and Secretary.

EDITORIAL NOTES

Records Broken

THE seventeen years' history of the British Industries Fair has been one of continuous progress; and the present Fair has broken all records. During the first week visitors from no fewer than 65 countries attended the various sections of the Fair, and the number of overseas buyers exceeded the total for the whole run of the Fair of 1931. As far as the Gas Industry is concerned, Birmingham is necessarily the Mecca, though gas is represented at Olympia by exhibits which we describe in our issue to-day, and obtains an excellent advertisement at the White City by its efficient employment as heating agent of one of the most difficult show places in this country to maintain comfortable conditions during the winter months. In all 80,000 people visited the British Industries Fair in London and Birmingham last Saturday—a record figure for the Fair. The Birmingham total alone, again a record for the heavy section, was 40,000. Special facilities were offered on that day for workpeople to attend the Section, and the buildings at Castle Bromwich were thronged throughout the day. On Thursday last H.R.H. the Prince of Wales visited Castle Bromwich and spent an arduous afternoon inspecting the displays. He expressed his admiration of the exhibits of the British Gas Industries Section, and signed the visitors' book in the Central Information Bureau.

Our impression of the Section of which we gave such a full account in the Special Number of the "JOURNAL" last week is that in more ways than one it shows a marked advance on any previous comprehensive display staged by our Industry. Both the display as a whole and the individual stands appeared to us as more attractive than ever, and there was far more novelty about the appliances shown. Any visitor to the Fair, whether or not associated with the Gas Industry, must have been struck by the beauty of modern gas apparatus and their efficiency in satisfying all the varied needs of to-day. And those closely concerned with the Industry's progress must have noted with great pleasure and profit a marked advance in the standard of salesmanship everywhere manifest in the Gas Section. The salesmen were better equipped than was generally the case formerly to answer technical queries to the satisfaction of the inquirer. The manufacturers, and the Gas Industry, will reap the due reward of a more enlightened view of salesmanship.

Working Results of the London Companies

ELSEWHERE in this issue we are permitted to publish the Comparative Working Results for the past year of the three Metropolitan Companies and six of the Suburban Gas Companies prepared by Mr. F. J. Bradfield, the General Manager and Secretary of the Commercial Gas Company.

It is not surprising that, with the extremely mild weather in the last few months of the year and the general trade depression through the whole of the year, the expansion of business was not up to the usual standard of Gas Companies. It is, however, very satisfactory to note that all the Companies have increased their gas sales—the percentages varying from 5·05 in the case of the Lea Bridge Company down to 0·36 in the case of the Commercial Company. Most of the Companies show an improvement in the number of therms made per ton of coal. The Lea Bridge Company, with vertical retorts, again lead with 81·28 therms, and the South Metropolitan Gas Company, with horizontal retorts, follow with 75·19 therms. The figure in which there is still a great variation between the different Companies is the gas unaccounted for, which varies between 7·56 p.ct. in the case of the South Suburban Company to 0·36 p.ct. in that of the South Metropolitan Company.

The Commercial Company again made the most coke for sale per ton of coal, with 11·09 cwt., and are followed by Croydon with 10·75 cwt.; and the Lea Bridge Company return the highest make of coal tar with 14·95 gallons per ton of coal, Hornsey being next with 12·94 gallons. With sulphate of ammonia having to be sold at less than cost price, it is not surprising that the make per ton of ammoniacal liquor is lower in some cases than usual. It has, however, been maintained by the majority, and the South Metropolitan Company show the greatest quantity per ton of coal with 41·44 gallons.

It will be noticed that an additional line has been added to the Analysis—viz., Capital employed per therm sold. This figure represents the amount on which dividend and interest are paid.

Comparing the principal items of the revenue account per therm, it will be seen that the South Metropolitan Company again show the lowest cost of coal at 3·22d., and are followed by the Gas Light Company for coals, oil, &c., at 3·28d; while the Commercial Company head the list for the amount received for residuals at 2·78d., Croydon coming next at 2·16d. The resultant net cost of coals, oil, &c., shows the Commercial to be the lowest at 1·07d., the South Metropolitan Company coming next at 1·39d. Distribution costs have been heavier in most cases; the largest increase being 0·25d. per therm in the case of the Commercial Company, while Hornsey shows the cheapest total distribution costs at 1·73d. per therm. There are again some big variations in the rent, rates, and taxes expenditure, which are possibly due to the inclusion in some cases of income-tax balance; but it will be seen that the highest cost of this item is by Lea Bridge at 0·72d. per therm, and the lowest 0·11d. in the case of the South Suburban Company.

The net total expenditure, as the principal factor in determining the price of gas, probably attracts the most attention, and it will be seen that there is really no wide divergence; the highest cost being 8·69d. by the South Suburban Company and the lowest 7·12d. by the Hornsey Company—the latter Company again having pride of place. The gas receipts of this Company, as would be expected, are also the lowest, but a further increase in the initial price turns a deficit of the previous year into a satisfactory surplus for 1931.

Two Companies only have been unable to meet the whole of their dividend and interest charges, the Commercial having a deficit of 0·11d. per therm and the South Suburban Company of 0·02d. per therm. As regards the rates of dividends paid, the Tottenham Company increased the distribution from $6\frac{5}{8}$ to $6\frac{3}{4}$ p.ct.; five Companies maintained the rates paid the previous year; while in three instances small reductions were made—viz., South Metropolitan from $6\frac{1}{4}$ to 6 p.ct., Commercial from 6 to $5\frac{7}{8}$ p.ct., and South Suburban from $6\frac{1}{2}$ to $6\frac{1}{4}$ p.ct.

The sundry figures at the bottom of the Analysis are again of interest. Without exception the cost of coal has increased, although in the case of Lea Bridge it was insignificant; but examination will show that, while two out of the three Metropolitan Companies also lost in the price obtained for coke per ton of coal, the Suburban Companies recovered by this means a part of such increased cost. This is also reflected in the coke per ton of coke prices; the three Metropolitan Companies were lower, but the Suburban Companies all realized better prices, the

highest being, as in 1930, Croydon at 24s. 9·66d. per ton, Hornsey following with 24s. 2·47d. per ton. The prices realized for breeze, as we have before remarked, are hardly comparable by reason of the variation in the products sold as breeze. In the case of tar, five Companies realized higher prices than in 1930, Wandsworth by as much as 0·67d. per gallon. The Commercial Company again obtained the best average price at 2·75d.; and for ammoniacal liquor, South Metropolitan, Commercial, and Hornsey are the only Companies to cover the expenditure. The other figures do not call for comment, except, perhaps, that it is noticeable that four Companies increased their percentage of water gas, the Tottenham Company from 10·01 to 28·87 p.ct.; the Lea Bridge Company, however, made the greatest proportion with 34·66 p.ct.

Money Matters

In its demands for fair play and its struggles for freedom from the hampering restrictions under which it is at present compelled to operate, the Gas Industry must not permit forgetfulness, on the part of the authorities or of the public, of the large amount of capital that is invested in it. The second part of the Board of Trade return for 1930, relating to authorized gas undertakings in Great Britain, which is procurable from H.M. Stationery Office, Adastral House, Kingsway, London, W.C. 2, at the price of 10s. net, states that the aggregate amount of the issued capital (share and stock, including premiums paid in respect thereof) and issued loan capital of the companies and of money borrowed by local authorities (including loans borrowed and since repaid) was £196,884,904. In round figures, £200,000,000 is at stake, in an industry which has conferred, is conferring, and will confer enormous benefits upon the community. Such an industry deserves the utmost possible consideration at the hands of our legislators—particularly when the consideration which it seeks will have the effect of still further increasing the value of its service.

The revenue account receipts of the 758 undertakings included in the return for the year 1930 (or to March 31, 1931, for local authorities in England and Wales) amounted to £66,986,800, while the expenditure was £55,675,079. Thus there remained a gross profit of £11,311,721. Comparing these figures with those for the twelve months immediately preceding, it is seen that the receipts fell off to the extent of £828,604 in the year under review, while the expenditure was less by £792,531. The difference between these figures reduced the gross profit by £36,073.

The number of undertakings belonging to companies which are included in the return is 443, having a total paid-up share and stock capital of £89,865,241, and issued loan capital amounting to £32,876,965. For 1930, the receipts on revenue account totalled £44,845,198, and the expenditure £37,781,061, leaving a profit of £7,064,137. As the expenditure fell off to a slightly larger extent than the receipts, the profit was slightly more than the £7,043,501 of the previous year. In 1929 the receipts on revenue account of the 452 companies included were £45,420,646, and the expenditure £38,377,145.

The number of municipally-owned undertakings included in the return is 315 on this occasion, and the total amount of loans authorized £79,789,918. The sum actually borrowed is £74,142,698, but there has been repaid, or is at present in sinking fund, £43,707,360—the repayments in this way during the twelve months under review having totalled £3,534,520. On revenue account both receipts and expenditure were a little down as compared with the previous year. The figures in this return are: Receipts, £22,141,602; expenditure £17,894,018; gross profit, £4,247,584. A year ago the corresponding figures were: Receipts, £22,394,758; expenditure, £18,090,465; gross profit, £4,304,293. The net profit is also reduced, at £713,064, which compares with £799,724 for the twelve months immediately preceding.

Circumstances & Standardization

On several occasions during the past ten years—and earlier—we have stated what appear to us as two axioms of gas manufacture and supply: that local circumstances must govern the choice of plant and the calorific value of gas; and that standardization, at the same time, should be an aim continuously in view. Every now and then an enthusiast of a definite calorific value presents a case which, without the "local circumstances" clause, is sound enough, at any rate for the immediate future; but we are yet to be convinced that calorific value could be usefully standardized for the country as a whole. The cost of the therm into the holder is obviously important, but the cost of the therm at the consumers' burners (satisfactory utilized) is the only basis to judge the success or otherwise of a gas undertaking. With growth in gas sales, and particularly with modern methods of housing, distribution has an increasing effect on the cost of the therm at the burner. This is well demonstrated by the tendency during the past decade to raise the calorific value of gas supplied. The same sort of thing is happening, of course, in the electricity industry. Here, distribution costs are enormous in comparison with the cost of manufacturing current; and consequently transmission at exceedingly high voltages is on the increase.

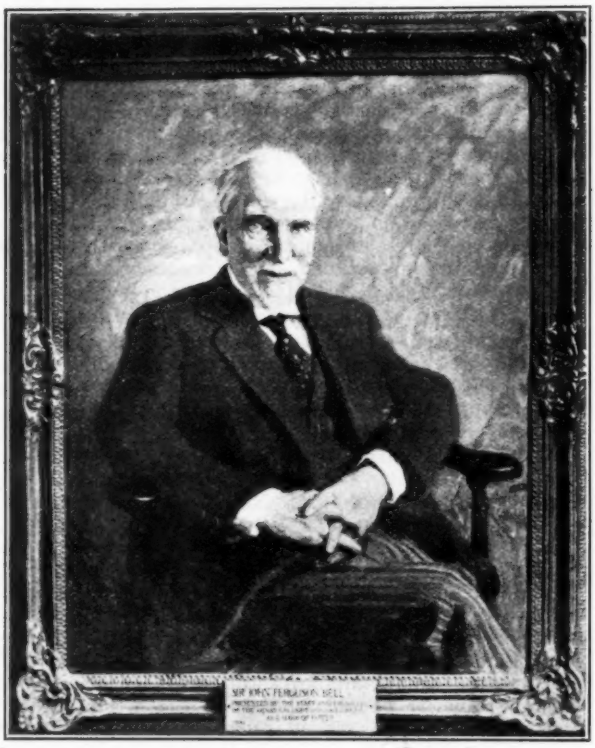
Exactly what has taken place in the Gas Industry during the past ten years is told by Mr. W. J. A. Butterfield, one of the Gas Referees, in later columns of this issue of the "JOURNAL." His account, which embodies information which only a Gas Referee can command, is being given at the Joint Gas Conference at the British Industries Fair, Castle Bromwich, to-day; and it will be studied with profit. It is a complete vindication of the Gas Regulation Act of 1920. No measure has done anything like so much to increase the efficiency of gas manufacture and supply, and to enhance the goodwill of the consumer. Mr. Butterfield quotes his colleague, Prof. Boys: "The fact is that no single commodity generally purchased by the public is so carefully watched and maintained of its guaranteed quality as gas, and it is a fairly safe thing to say that gas and water, about the cost of which complaints are so often made, are the two things ordinarily bought which are best worth while." The uniformity of gas supply is very different to-day from what it was before the passing of the Act; and there can be no doubt that the recording calorimeter has played a major rôle in raising the standard of gas manufacture. The statutory obligations and testing provisions created by the Gas Regulation Act have acted as a stimulus to high efficiency of production and to lasting satisfaction of the consumer. There is no question that the sale of gas by the therm has conduced to a supply being given which meets the consumer's needs better than the supplies given in most districts in earlier periods. The Gas Regulation Act may be regarded as the "Gas Consumers' Charter."

Mr. Butterfield's Table I. is a prophet's delight. It can be seen from it that most of the gas sold at the present time is within a narrow range of calorific value; and the old question, "Why not standardize gas appliances?" has more significance than ever. Thirteen years ago the Fuel Research Board proposed that burners in gas appliances should be standardized for a limited number of calorific values. At that time we liked the idea; to-day we like it a great deal better. We should be surprised if the majority of our readers, after even glancing at Table I., could put forward adequate argument justifying the gas and air adjuster for, say, lighting burners, within the range of calorific value of which we are speaking. The gas and air adjuster cannot be regarded as a right principle. Maintenance men tinker about with the adjustment at a pressure dependent on the time of their visit; the consumer tinkers about when he wants light. Fundamentally the practice is the reverse of efficient; and we believe that the Gas Industry should aim at the provision of switch-operated lighting, and not appliances for the "potterer." The "maintenance" of gas lighting burners ought not to have to include such adjustment. Besides, the remedy is simple.

PERSONAL

PRESENTATION TO SIR JOHN FERGUSON BELL.

Upon his retirement from the position, after 30 years' service, as General Manager and Engineer of the Derby Gas Light and Coke Company, of which, in recognition of his invaluable work, the Directors have now appointed him as Chairman and Managing Director, Sir John Ferguson Bell was presented by the officers, staff and workmen, with his portrait in oils painted by a local artist, Mr. E. Townsend. In addition to 400 of the present employees of the Company, the assembly included many of the former employees.



Mr. J. P. McCrae, the new Chief Engineer and Manager, presided, and recalled the fact that Sir John came to Derby from Stafford, where he had been Engineer and Manager to the municipal gas and electricity works. During his association with the Derby Works there had been wonderful strides on the scientific and commercial sides of the undertaking, and he had always kept the plant up to date. In addition to his strenuous duties as General Manager and Engineer, he had performed much useful work for the municipality, in recognition of which the honour of knighthood had been conferred upon him. Sir John had served as Mayor of the Borough and had also served with distinction as President of the Institution of Gas Engineers.

Several of the other members of the Company's staff also spoke in appreciation of Sir John's uniform kindness. Mr. Webster, a retired employee, who had been for 54 years in the service of the Company, mentioned the interesting circumstance that in 68 years the Company had had only two Managers.

The portrait was presented by Mr. Radford, one of the oldest workmen.

Sir John Ferguson Bell, in response, said that much of his success had been due to the encouragement of his wife. Alluding to his relationship with the employees of the Company, he said that he had always looked upon them as his friends. In regard to the growth of the undertaking the output of gas since 1900 had increased more than threefold, the number of consumers had more than doubled, the length of mains had advanced from 90 to 300 miles and five other gas concerns had been absorbed.

Mr. JOHN E. HALL, a Director, also Manager and Secretary, of the Prescot and District Gas Company, is suffering with an attack of acute gastric influenza, and although making satisfactory progress will be unable to transact any business for a few weeks. Mr. JOHN S. HALL, the Assistant Manager and Secretary, is in sole charge.

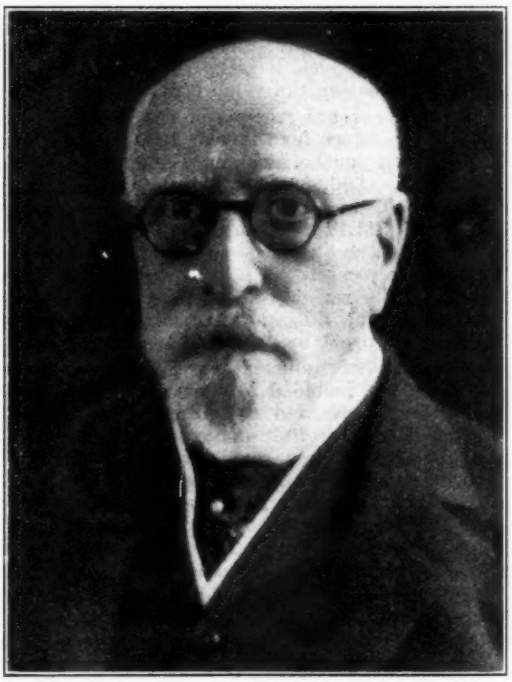
RETIREMENT OF MR. G. J. COHEN.

After 46 years as a member of the Board of the Australian Gas Light Company, during 44 of which he was Chairman of Directors, Mr. George Judah Cohen retired in January from the Board.

Mr. Cohen has reached the age of 89 years and he is regarded as the leader of Australian finance and business. Born in Sydney, he was educated at University College, London, and returning to Australia joined his father's firm of David Cohen & Co. He soon became prominent in many public companies. In 1870 Mr. Cohen first became associated with the Gas Industry at Maitland, N.S.W. At that time the local Gas Company was unable, through lack of capital, to meet the increasing demand for gas. Mr. Cohen was appealed to, he raised the necessary capital and accepted the Chairmanship of the Company. Mr. Cohen at that time was very fully engaged during the day, but he spent his evenings organizing the affairs of the Maitland Gas Company, of which, he says, he was Manager and most of the staff. His remuneration was £50 a year.

The price of gas at Maitland was then 25s. per 1000 c.ft., but ten years later, when Mr. Cohen left the town, it was down to 10s. Mr. Cohen joined the Australian Gas Light Company as a Director in 1885 and two years later was elected Chairman. In 1885 the number of houses served with gas in Sydney by the Australian Gas Light Company was 17,278. The number has now grown to 247,267. The annual revenue of the Company has risen during that time from £229,000 to £2,116,000. The capital of the Company has increased from less than £1,000,000 to more than £6,800,000.

The Australian Gas Light Company is regarded as among the most modernly-equipped and efficiently operated organizations of its kind in the world, and it was largely due to the foresight and long distance planning of Mr. Cohen that the A.G.L. has always kept so well in the fore and is now the fifth largest gas company in the British Empire.



[Photo by Falk.

Mr. Cohen was entertained at a farewell luncheon by the Directors and Senior Officers of the Company. Mr. A. Consett Stephen, who has succeeded him in the Chairmanship, presided, and a presentation was made to Mr. Cohen.

Two years ago Mr. Cohen retired from the Directorate of Tooth's Brewery, but despite his advanced years he still retains the Chairmanship of the Commercial Banking Company of Sydney, the United Insurance Company, and the Sydney Exchange Company, together with extensive private trading interests.

MR. HERBERT GEORGE WARREN.

On Feb. 20 last Mr. Herbert George Warren completed fifty years in the service of the Danish Gas Company, and to celebrate the occasion a dinner was held in his honour at the Savoy Hotel on Feb. 24, when a handsome table canteen of silver and cutlery was presented to him by the Directors and shareholders of the Danish Gas Company to

mark their appreciation of his loyal, able, and devoted service to the Company for a period of fifty years. Lt.-Col. M. M. Bidder, D.S.O., was in the chair, while other Directors and officials of the Company were present.

Mr. Warren was born in 1861, and was for some years with Messrs. Le Grand & Sutcliff, artesian well engineers, prior to his joining the Danish Gas Company, to whom he has acted since 1901 as London Agent and Secretary, and also as Secretary to the Committee of Shareholders. Mr. Warren's many friends in the Industry will, we are sure, join with us in congratulating him and wishing him continued health and success.

Mr. H. M. TYSOE, late of the City Gas-Works, Johannesburg, has been appointed Manager and Secretary to the Keswick Gas Company.

Mr. ANDREW WILSON, who has occupied important executive positions with the Australian Gas Light Company, of Sydney, for over twenty years, retired from the office of General Manager and Secretary at the end of last year, and has been appointed a Consulting Engineer to the Company. The Directors have appointed as his successor Mr. HAROLD TINDALE. Mr. Tindale has, during his occupancy of the positions of Works Manager and Assistant General Manager, acquired a thorough knowledge of the Company's business; and the progressive policy of the past is assured of continuance under his experienced guidance.

The Directors and Staff of the Woodall-Duckham Companies have been deeply touched by the expressions of sympathy received from all parts of the world in the loss sustained through the untimely death of their Chairman, Sir Arthur Duckham. They have endeavoured to reply personally to all the messages of condolence they have received, but in case there has been any omission on their part, they would like to use this occasion to express their gratitude to all who have written. The sympathy expressed will be of great assistance in helping them to continue the responsibility of carrying on the business established under Sir Arthur's leadership.

A short time ago, Mr. ALFRED HUTCHINSON, Foreman of the Distribution Department of the Harrogate Gas Company, was presented by Mr. Francis Barber, on behalf of the Directors of the Company, with a solid silver salver and a cheque in commemoration of his 50 years' service with the Company. On Friday last this was followed up by a further presentation of a silver mounted walking stick and a case of cutlery from the staff and the workers in the Distribution Department.

OBITUARY

The death occurred on Feb. 27 of Mr. W. R. SILK, who was for a great number of years agent for the Castings and Lime Departments of the Clay Cross Company, Ltd.

CORRESPONDENCE

Intermittent Vertical Chambers—Bottom Gas Offtakes

SIR,—The correspondent in your issue of Feb. 24 has obviously based his reply on a perusal of the illustration (only) in the 1910 "JOURNAL;" hence the necessity to restate that the "Elland" intermittent vertical retorts always had the main gas offtakes at the top, the bottom gas offtakes always being auxiliary.

H. J. TOOGOOD,
Robert Dempster & Sons, Ltd.

Rosemount Ironworks,
Elland,
Feb. 29, 1932.

The Salerni Process

SIR,—I have followed with considerable interest the references and articles appearing in the "JOURNAL" on the Salerni process, with all the more interest since the names of professors and high dignitaries of one of our best-known Universities are referred to by Commendatore Salerni as the technical sponsors of his new low-temperature process, in regard to which not only my own curiosity but, I believe, that of a great number of other people has been raised to the highest pitch of expectation. We have seen in the lay Press for some time past almost daily bulletins as to how and when important announcements regarding the Salerni process were to be made. We have seen that Commendatore Salerni has received a deputation from the City Fathers of a big Midland town, supplicating him to honour that particular district with the first Salerni retort. We have heard about units of 1000 tons a day; about an eminent banker's personal interest—in fact, the whole campaign has left one guessing as to the real nature of this invention, which, so we have been told, by adapting old-established and well-tried principles will at one stroke solve all difficulties. We have been expecting something in the nature of a miracle, and now that at last the jealously guarded secret has been divulged, it is so palpably impossible of achievement that it leaves us aghast.

At the same time, I greatly admire the public spirited action of Commendatore Salerni's financial backer in finding out of his own pocket a sum which I, from my own personal experience, estimate cannot be far short of £75,000 to £80,000, to prove the commercial feasibility of a large unit.

Is it a fact, or is it not, that the picture of the first Salerni experimental retort which appeared in a well-known Yorkshire paper on Wednesday last is the sole basis and foundation for the tremendous Press propaganda? Is it a fact that observations made in a corner of a laboratory on a small, evidently makeshift plant, capable, I should judge, of dealing with 1 cwt. of coal a day, are to be translated direct into retorts of a capacity of 100 tons a day each?—a few weeks ago it was 1000 tons a day each. Well, I can only say that my admiration for the Commendatore's campaign is infinitely greater than my belief in the possibilities of effecting such a translation.

I am, as you are probably aware, closely associated with low temperature, and have been so for many years, and I know sufficient about coal and its heat treatment to realize that you have to go step by step, and to attempt to jump from 1 cwt. a day to 100 or 1000 tons may appear easy on paper, but it is a different story when it comes to actual practice. Have we, high and low temperature people, for the last century been completely at fault? Have we been so blind as to the real nature of coal and its behaviour that

the solution as made light of by Commendatore Salerni should not have been obvious to us long ago? Sir, I cannot believe it. The design of the Salerni large-scale units, of which I have seen illustrations, is from an engineering point of view very ingenious, but from a practical carbonization and heat transference point of view it is so much beyond everything that is known at present of the art that I shall need some strong convincing. I have myself made a stride from 10 tons a day to well over 100 tons in one step, but only after years of work. Now comes the Commendatore with his revolutionary ideas, still based on old-established and well-tried mechanical principles, and he is going apparently from 1 cwt. up to 100 or 1000 tons a day.

Now, I recognize that what is impossible to-day may be an accomplished fact to-morrow, but big jumps like those foreshadowed require more than glib talk and well-conducted Press propaganda for their successful accomplishment. Why did the Commendatore, when he was so sure of his facts, not follow the usual line of action by frankly presenting his case to one of the learned institutions, of which there are many in this country?

HARALD NIELSEN.

48, *Broadway, Westminster, S.W.* 1,
Feb. 26, 1932.

THE NEWS OF THE WEEK

The Port Talbot Council at their monthly meeting agreed to reduce the price of gas for industrial purposes from 4s. 2d. to 3s. 6d. per 1000 c.ft.

Two Important Development Schemes initiated by the Derby Gas Light and Coke Company involving an expenditure of £57,383 are now nearing completion. They are the erection of a new gasholder at the Belper Works and the putting down of a new gas plant at the Blackwell and Clay Cross Coke Ovens. To meet this outlay £40,000 has been transferred from the development fund account.

The Darwen Gas Committee have recommended that gas shall be reduced from 4s. 2d. to 3s. 11d. per 1000 c.ft. for ordinary supplies. Reductions on the same ratio are recommended for gas engines, slot meters, and public lighting. The Committee will have to consider building new plant, experts regarding the existing system, provided just before the war, as obsolete; or arrange for an alternative supply from other works.

The Bristol Gas Examiner (Mr. E. Russell) in his report on the tests of gas supplied by the Bristol Gas Company for the quarter ended Dec. 31, 1931, states that the results were: Average calorific value for the quarter 481·2 B.Th.U. per c.ft.; number of days on which the calorific value was deficient by 6 p.ct. or more—none; number of days on which sulphuretted hydrogen was present—none; number of testings in which pressure was less than 2 in.—none.

The Directors of the Huyton and Roby Gas Company some time ago approached the Directors of the Liverpool Gas Company in regard to the sale of the Huyton and Roby concern to the Liverpool Company. After protracted negotiations, the Boards of the two Companies have come to a provisional agreement, the terms of which are subject to the approval of the proprietors of each Company and to the sanction of the Board of Trade being obtained.

According to the Estimates of the Manchester Corporation Gas Committee, sales of gas during the year ending March 31, 1933, are computed to bring in revenue of £1,218,000; hire of gas fires &c., £40,000; coke, £152,000; tar, £40,000. Total income is estimated at £1,444,500. Expenses on the manufacture and distribution of gas, administration, rents, and rates, are scheduled at £1,400,450. Expenditure on capital account during the coming year will not be heavy. It is intended to spend £10,000 on meters, cookers, and fires, and £10,000 on mains and service pipes.

Whitwell Council and Gas Charges.—The Whitwell Council (Derbyshire) at a recent meeting discussed a new scale of charges from the Whitwell, South Yorkshire, and Derbyshire Gas Company as follows: First 15 therms 14d. against 14·2d., equivalent to 5s. 6½d. per 1000 c.ft.; second 15 therms 11d. against 11d., equivalent to 4s. 4½d.; all excess 10d. against 11d., equivalent to 3s. 11½d. per 1000 c.ft. These charges are subject to five meter readings per year as against four, a provision which the Councillors contended negatived any advantages of the reduced charges. There was a strong feeling among the Councillors that the proposed reductions were not sufficient. The Council decided to write to the Gas Company complaining about the price of gas and asking them either to reduce it or to revert to the old custom of four readings a year.

Midland Association.—The Annual General Meeting of the Midland Association of Gas Engineers and Managers will be held at the Grand Hotel, Birmingham, on Thursday, March 10, at 2.30 p.m., to receive the annual report and statement of accounts, and to induct the new President, Mr. E. B. Tomlinson, who will deliver his Presidential Address.

Manchester Association.—The 62nd Annual Meeting of the Manchester District Association of Gas Engineers will be held at the Midland Hotel, Manchester, on Tuesday, March 15, at 2.30 p.m., to receive the annual report and statement of accounts, and to induct the President-Elect, Mr. C. W. Ward, A.M.Inst.C.E., of Wakefield, who will deliver his Presidential Address.

Sir Francis Goodenough, President of the Incorporated Sales Managers' Association and Chairman of the British Commercial Gas Association, on Feb. 25 opened Margate's eleventh Annual Exhibition and Civic Festival, of which the theme is "British First." Congratulating the town upon its enterprise, Sir Francis said that true economy consisted in frugal—that is, fruitful—expenditure, and there was no direction in which carefully considered expenditure was more fruitful than that of publicity in particular and business development in general. This critical period in the history of our country was one that called especially for initiative, enterprise, and courage, the qualities that made us the foremost trading nation in the world and built up the British Empire.

Meetings of the Illuminating Engineering Society.—Special meetings of the Illuminating Engineering Society are to be held shortly as follows: On Thursday, March 10, in the Reynolds Hall (Room 3) of the Manchester College of Technology, Sackville Street, Manchester, when an address will be given by Mr. Clifford C. Paterson, O.B.E. (President of the International Illumination Congress), on "Some Thoughts on the Congress." Also, on Monday, March 14, in the Assembly Room at the Chamber of Commerce, New Street, Birmingham, when addresses will be delivered by Mr. D. Spencer-Johns on "The Importance of Good Lighting in Commerce and Industry," and by Mr. P. E. Shopland (H.M. Inspector of Factories) on "Some Observations on Lighting in Factories." Light refreshments are to be provided prior to each of these meetings.

The Chairman of the Electricity Committee opened an exhibition of gas appliances at Ashton-under-Lyne, last week. The rôle was filled by the Mayor of the town, who declared that healthy competition is good for both industries. "I have no doubt," he said, "that the demonstrators representing the various firms engaged in making gas appliances will put up a good case for their products, and if that is, in your opinion, better than we could put up on the electrical side, then so much the better for our Dukinfield gas undertaking, and we must look elsewhere for consumers of electricity. The fight for supremacy will still go on, and neither side will ever be able to claim a monopoly, in my opinion, in illumination, cooking, heating, and power. The great benefit of exhibitions such as this is that consumers of both commodities get improvements in the appliances which would never eventuate but for the healthy competition."

Yorkshire Junior Gas Association.

Visit to Bingley Gas-Works.

By invitation of the Bingley Urban District Council Gas Committee, the members of the Yorkshire Junior Gas Association met at Bingley Gas-Works on Feb. 20, for an inspection of the new vertical carbonizing plant, erected by Messrs. Drakes, Ltd., of Halifax, and completed two years ago. A full description of the plant was published in the "JOURNAL" for March 26, 1930.

It had been intended that after the works visit there should be a paper by Mr. G. A. Winfield, of Sheffield, but Mr. Winfield found it was not possible to maintain that arrangement for the February meeting. Mr. J. B. Balmforth, Engineer and Manager of the Bingley Gas Undertaking, generously stepped into the breach and gave an account of the development of the Bingley Gas Department in the face of difficulties.

After the tour of the works a call was made to see the Department's showrooms in the main street, and thence the party moved to the Princess Hall for the meeting, and subsequently for tea as the guests of the Gas Committee.

Mr. J. W. HOLROYD (Rotherham), the President of the Association, presided; and the members were welcomed by Councillor TOM SNOWDEN, J.P., Chairman of the Bingley Gas and Electricity Committee; and Councillor BENTLEY, Deputy-Chairman of the Committee.

In the course of his address, Mr. BALMFORTH explained that a few years ago a new showroom was opened on the main street, and is doing good business. Although when advocating this scheme he did not claim that it would actually pay as a showroom, he said it would certainly increase the consumption of gas, create goodwill, and give better service to the consumers, which, of course, cannot be counted in mere terms of £ s. d. As a matter of fact, apart from all these considerations, the profit made on the actual sale of appliances, cash and hire-purchases, more than clears the expenses. "Of course, we have simple hire for most appliances as well, and quite recently we have fixed hundreds of sink water heaters on simple hire, and I confidently expect this to be a good source of revenue." As for public lighting, the streets of Bingley are all lit by gas with the exception of a few electric overhead lamps on the main street.

Mr. J. W. HORWILL (Bradford), Immediate Past-President of the Association, proposed a vote of thanks to Mr. Balmforth for his paper, to the Chairman and members of the Gas Committee for their welcome and hospitality, and to the members of the staff who had helped during the day.

Mr. A. W. ELLIOTT (Elland) seconded the motion.

Mr. BALMFORTH, replying, expressed appreciation of the help given him by members of his staff in the preparation of the paper and arrangements for the day's visit.

Running Omnibuses by Coal Gas.

Birmingham Gas Department has for some time interested itself in the possibilities of running omnibuses by coal gas. Recently a deputation went to Paris to see what was being done there; and they reported that there was no difficulty in the way of the application of compressed town gas for the propulsion of heavy motor vehicles, omnibuses, and lorries. The Birmingham Department is now experimenting with British-made cylinders, and is purchasing a small compressor for compressing gas to over 3000 lbs. per sq. in. As soon as sanction is received from the Home Office the Department will apply the cylinders to passenger-carrying vehicles, and a practical demonstration will be given in Birmingham.

Secrets of the Telephone.

Wonderful Exhibit at Olympia.

The greatest and most wonderful telephone exhibit ever shown to the public will be presented by the Post Office at the "Daily Mail" Ideal Home Exhibition which opens at Olympia on April 5.

The Post Office is convinced that the Ideal Home cannot be a complete house without all the many advantages to be derived from the installation of the telephone service. In deciding, for the first time in the history of the Department, to enter a public exhibition on an extensive scale, the Post Office has selected the Ideal Home Exhibition as the most successful in the kingdom and that best calculated to attract to the telephone service the most widespread national attention.

For this enterprising publicity the Department has taken one of the most extensive sites at Olympia, occupying the major part of the second floor of the Empire Hall.

Post Office engineers hesitate to set a value to the exhibit to be staged, but it will not be less than £250,000.

A special power station will be erected at Olympia and each instrument and piece of equipment shown will be laid down with a thoroughness not less than that demanded by permanent installation.

In demonstrating the amazing magnitude and complexity of the telephone service, no phase of telegraphy or telephony will be overlooked in the Ideal Home Exhibition. The first telephone and the most modern instrument will be shown.

Secrets of the world-famous Post Office Engineering Research Station at Dollis Hill, N.W. 2, will be revealed in detail.

Marvellous instruments, in the creation of which hundreds of thousands of pounds have been spent on research, will be shown to every visitor, and the public will be at liberty, almost within any limits, to work the machines themselves.

Cornish Association of Gas Managers.

At the Annual Meeting of the Cornish Association of Gas Managers last week Mr. F. G. Kingwell (Falmouth), who has been the energetic Secretary of the Association for several years, was unanimously elected President, and Mr. W. J. Couch (Camborne) was appointed Hon. Secretary.

The Brownhills Amalgamation.

The proposed amalgamation of the Cannock and Hednesford Gas Company, Ltd., and the Ogley Hay and Brownhills Gas Company, Ltd., has been approved by the Board of Trade under the Cannock and District Gas Order, 1931.

Several weeks ago when the Brownhills Urban Council proposed to purchase the Brownhills undertaking the scheme was rejected by a poll of the ratepayers by a large majority. The Brownhills Company has raised capital only to the amount of £14,745, but the Cannock undertaking has an authorized capital of £75,000, of which £64,477 has been paid up.

Mr. H. Davenport (Cannock), who has been a Director of the Cannock Company for many years, is retiring owing to continued ill-health, and his position is not to be filled, as under the amalgamation scheme three of the Directors of the Brownhills Company will automatically become Directors of the Amalgamated Company.

Reactivity of Coals.

At a Meeting of the North-Western Section of the Institute of Fuel held on Feb. 10 at the Engineers' Club, Manchester, a paper entitled "The Maintenance of Uniformity in Industrial Fuels" was read by Dr. A. C. Dunningham. Mr. A. McCulloch presided.

Dr. Dunningham said that the method adopted for the determination of reactivity of coals was a modification of that used by the Northern Coke Research Committee, and consisted in burning a column of fuel under standard conditions, and with a carefully controlled air supply, and noting not only the temperature of combustion, but also the ratio of CO to CO_2 in the products of combustion. The test was necessarily empirical, for comparative results were entirely dependent on the maintenance of arbitrarily fixed conditions. Results so far obtained gave certain very definite indications of the behaviour of a fuel when burned in a large-scale plant, and might be expected to yield information of considerable technical value. The results obtained seemed likely to throw further light on the question of the reactivity of coke, upon which so much fruitful work had been done by the Northern and Midland Coke Research Associations. The majority of tests so far made had been carried out on coals of poor coking properties, but a limited number had been made upon good coking coals, and a comparison had been made between the reactivities of these and of high-temperature cokes made from them. No attempt had been made to coke the particular samples of coals used. The comparisons had been made between commercial cokes and coals from the seams known to be used in their manufacture. Before the actual determination of reactivity, all coals were coked at 400° to 420° C. until the evolution of volatile matter ceased, and then raised to 800° C. to expel further volatile matter. Thus the conditions were entirely different from those used industrially, and the physical character of the coke so produced was entirely different. Yet it had been found that the reactivity as indicated both by temperature of burning and by formation of CO was very similar in both cases. This would seem to confirm the view that reactivity was inherent in the original coal, and that other

THE NEWS—continued.

factors, such as conditions of coking, were of secondary importance. It would seem, indeed, that there had merely been success in divorcing reactivity from physical properties such as the " shatter " index.

There was as yet no definite data correlating reactivity with the catalytic effect of the inorganic impurities (inherent ash). To what extent they were related was at present a matter of conjecture.

Scottish Junior Gas Association (Eastern District).

Visit to Works of Alder & Mackay, Ltd., Edinburgh

Members of the Eastern Section of the Scottish Junior Gas Association spent an interesting afternoon on Saturday, Feb. 13, when they visited the New Grange Works of Messrs. Alder & Mackay, Ltd., Edinburgh. There was an exceptionally large attendance, and on arrival at the works the visitors were received by members of the Board and staff.

Mr. J. L. BENNET, Technical Director, in a short, instructive talk on gas meters, remarked that a notable feature of their factory is that it depends primarily on gas. Lighting is mainly by high-pressure Keith lights; soldering irons are heated by gas and compressed air, and white metal moulding, brazing, and tempering operations are all conducted by gas. Electric power is used for the presses and some individual machines, but the main power supply is by two 45-H.P. gas engines. The total gas consumption in the factory amounts to some 7 million c.ft. per annum.

Members were first shown the stamping machines and heavy power presses turning out and setting up parts for various sizes and types of dry meters on the ground floor. Some of those machines have an output of over 7000 pieces per day. The course of these parts was followed through the relative stores to the top flat, where case-making and " bellowsing," the first assembly operations, are conducted. In the leather room they saw the Persian sheepskins being cut, oiled, and treated preparatory to being made into pan and bag diaphragms. The factory is on the departmental system, and the assembly of the meters was followed through the fitting, gassing, proving, and finishing processes to the paint shop, where they are enamelled by the spray process under 60 lbs. air pressure.

As far as possible each subsidiary department was visited at its correct stage, and the visitors were shown the assembly of the indices from wheels cut by new semi-automatic gear hobbing machines; the moulding of the valve gratings and covers and other white metal parts; and the mass production of innumerable small brass components on automatic lathes. The visitors were then shown over the main brass finishing shops, where they witnessed the manufacture and assembly of the dual coin prepayment attachments, clockwork controllers, pressure recorders, &c.

Other departments inspected included the brass foundry and those devoted to the manufacture of cast-iron dry meters, street lanterns, and wet meters.

Those present were afterwards entertained at tea by the Directors of the Company.

Mr. J. L. Bennet spoke on the subject of the number of specially fitted meters which makers were asked to supply, and their effect on costs and delivery, to the mutual inconvenience of both the maker and the customer. He pointed out that taking 275 parts to each prepayment meter, an average of over 250,000 pieces were handled at least once, and some of them as many as five times, in a normal week's production of meters in the Company's New Grange Works. Taking the conservative average of three operations per piece, the number of operations performed per week exceeded three-quarters of a million. If these operations were to flow steadily and surely from week's end to week's end with accuracy and good fitting, it was obvious that the introduction of some special feature on small number of meters must complicate matters and seriously inconvenience the staff. Everyone was entitled to his own opinions, and he did not presume to attempt to alter their views, but he felt that sooner or later the question of special meters would have to be viewed in the light of special selling prices. Meters could not be taken out of stock for alteration, as the special feature usually required to be introduced from the start, and there was no doubt that at the moment too much delay was being caused in many meter works through customers wishing their own particular ideas incorporated into what should be a mass production article, since it was offered at a mass production price.

Mr. Bennet also spoke on the question of the maker's guarantee, and the unjust claims sometimes made under it. Great care was taken to ensure that bearings, valves, stuffing boxes, &c., were adequate for their job at the meter's capacity and even considerably over it, and he, personally, could vouch for the constant watchfulness of the staff who were directly responsible to the higher officials for the assembly of a soundly constructed meter. He had every confidence in the Company's product, which should, if properly treated, give no trouble under guarantee; but too often troubles arose from careless handling of the meter, gross overworking, and the installation of meters in unsuitable positions. He gave instances of meters having been returned deranged from the results of a heavy fall, others which had been subjected to heat, or continual drips from the bottom of a wash tube. He said that many cases of complaint need not arise if customers would take the precaution of treating gas meters as scientific instruments even if they are sold at commercial prices.

Mr. David Garrie, the President of the Association, replied, and thanked the Company for the educative afternoon they had given the Association. He agreed that the gas meter merited every consideration, since it was expected to hold the scales equally between the producer and the consumer for a large number of years. He had noticed the meticulous care with which the " A. & M." meter was assembled, and he considered that such a visit as the Association had made that afternoon did a lot to maintain the Industry's confidence in the appliances they installed. He asked Mr. Bennet to convey to his Board of Directors the thanks of the Association for the hospitality they had shown.

Institution of Gas Engineers.

Members of the Institution of Gas Engineers are cordially invited to attend the Sessional Meeting of the Institution of Heating and Ventilating Engineers at Swedenborg Hall, 20, Hart Street, Bloomsbury, London, W.C. 1 (entrance in Barter Street), on Wednesday, March 2, 1932, at 7 p.m., when Mr. A. C. Pallot, B.Sc., will read a paper on " Pipe Corrosion."

Copies of the recently issued British Standard Specification for dimensions of black bolts and nuts, studs, lock nuts, and washers (No. 28-1932) may be obtained, price 2s. each, including postage, from the Institution of Gas Engineers, 28, Grosvenor Gardens, London, S.W. 1.

Mr. H. D. Madden Addresses Insurance Institute.

Mr. H. D. Madden, M.Inst.C.E., M.I.Mech.E., General Manager and Chief Engineer of the Cardiff Gas Light and Coke Company, addressed a meeting of the Insurance Institute of Cardiff on Feb. 23 at the Mayfair Café, Cardiff.

Mr. Victor Dean, President of the Institute, occupied the chair, and there was a large attendance. The President said that Mr. Madden had addressed them as far back as seven years ago.

Mr. Madden, whose address was illustrated with lantern slides dealt interestingly with coal handling and storage and the manufacture of gas and the treatment of residual products. He said that power costs of industry averaged between 1½ and 2 p.ct. of the total cost of production, and the heat treatment in trade and industry was of a vastly higher percentage in production costs. Scientific minds were beginning to turn to the carbonization of coal, and of recent years there had been a return of interest in coal in regard to its distillation and the formation of the products of smokeless fuels, motor oils, tar products, and road-making materials. The work of the Fuel Research Board in regard to high and low temperature carbonization, the hydrogenation of coal, and the resultant tars indicated lines of research and progress in that direction.

Mr. Madden said that Pall Mall and Westminster streets had been continuously lighted by gas for the past 120 years, and the International Illumination Congress held in England last autumn voted the Whitehall illumination, carried out by high-pressure gas lamps, the finest example of its kind.

He said that 100,000 men were directly employed in the Gas Industry, and a large number, including some 70,000 miners, found employment indirectly through it. The Gas Industry of this country was practically 100 p.ct. British, and a gas undertaking in any particular city or urban area was one of the largest ratepayers in the district.

Referring to the Gas Industry's contribution to smoke abatement, he said that the large number of household gas appliances for heating and cooking and the gaseous fuel used in trade and industry had done enormous work in dealing with the smoke nuisance and helping to attain

clearer skies and purer sunshine. In war time the Industry served the community by providing the basis of explosives, antiseptics, and fuel oils.

There were some 3000 different trades in Great Britain using gas as a fuel for heat treatment in 7000 processes.

Mr. Madden invited those present to visit the Cardiff Gas-Works, where, he said, the Company would be pleased to entertain them.

European Gas Company.

The European Gas Company is not to proceed with a scheme, which was to be recommended to an Extraordinary General Meeting, whereby the Company's Articles were to be so modified as to fix the proportion of stock held by British shareholders at not less than 80 p.ct. of the total capital. Share warrants to bearer were to be regarded under the plan as not held by British holders. [See "JOURNAL" for Feb. 17.]

It came to the knowledge of the Board, however, that there was a substantial body of opinion opposed to the proposed modification, precluding the possibility of that practical unanimity which the Board consider essential for so important a change in the constitution of the Company, and therefore, in the circumstances, they do not feel justified in proceeding with the scheme.

THE YEAR'S RESULTS.

The Company's operations during the year 1931, as indicated by the report of the Directors, were affected by abnormal external influences. On the one hand there was a definite deterioration in the industrial situation in France, which resulted in a shrinkage in the gas consumption in the latter part of the year. On the other hand, the Company benefited during the later months by the improved value of francs in terms of sterling.

After providing for all charges, the profit on the year's operations amounts to £58,844 11s. 4d. An interim dividend at the rate of 2 p.ct. was paid in October last, and the Directors now recommend that a final dividend of 3¼ p.ct. be paid, making a total of 5¼ p.ct. for the year, free of income-tax, and that the balance of £6230 2s. 4d. be carried to general revenue. The quantity of gas sold remained practically stationary, the increase being only 0·12 p.ct. The number of consumers rose from 156,402 to 160,283, a gain of 3881 in the year, or at the rate of 2·48 p.ct.

At Boulogne, a commencement was made with the construction of two settings of vertical chambers, with coke sorting and storage plant. A contract was let for the construction of two batteries, each of eighteen similar chambers, with the appropriate coal and coke handling plant and necessary buildings, at the new works at Roche Maurice, Nantes.

The Society of British Gas Industries.

A Meeting of the Council was held at 56, Victoria Street, S.W. 1, on Feb. 18—Dr. E. W. SMITH, Chairman, presiding. Those present were: Messrs. E. J. Fox (Vice-Chairman), Frank West, C. A. Goodall, T. A. Clapham, T. F. C. Potterton, W. H. Handley, L. Hartley, R. J. Milbourne, H. M. Thornton, B. B. Waller, H. E. Bennet, Ernest West, A. Comley, F. C. Tilley, D. W. Turner, F. J. Gould (Hon. Treasurer), E. J. Davison (Hon. Secretary), Col. E. A. Wilson, and Mr. Arthur L. Griffith, Secretary.

Apologies for absence were reported from Messrs. John Orme, Geo. Clark, T. O. Wilton, and W. J. Gardner.

The Vice-Chairman referred in feeling terms to the death of Sir Arthur Duckham, one of the Past-Presidents of the Society, which was a very great loss to the Gas Industry and the whole country, of which he was one of the outstanding leaders. He expressed sympathy with Dr. Smith and his co-Directors.

The following Resolution was unanimously passed, the members rising in their places as a mark of respect:

> The Council of the Society of British Gas Industries have learnt with very sincere regret of the death of Sir Arthur Duckham, one of their distinguished Past-Presidents, and wish to place on record their appreciation of his valuable services to the Society and to the whole Gas Industry.
>
> They desire to convey to Lady Duckham and the family their deep sympathy with them in their great loss.

It was reported that Mr. Arthur H. Lymn had agreed to represent the Society on the Grand Council of the Federation of British Industries for Main Group 2, Sub-Group 12, Coke Ovens, Gas Conveying and Chemical Plant, in place of Mr. Samuel Cutler.

Mr. Frank West was re-elected as the Society's representative on the British National Committee of the World Power Conference.

It was agreed to offer prizes of five guineas and two guineas to the first and second candidates in the Examinations of the City and Guilds of London Institute in Gas-Works Practice, Gas Supply Practice, and Gas Fitting for the Session 1932-33.

It was reported that the question of British glass for gas lighting was being thoroughly investigated by the Glass Manufacturers' Federation.

Newton Abbot Gas and Coke Company.

Annual Dinner.

Speaking at the annual dinner on Feb. 20, of the employees of the Newton Abbot Gas and Coke Company the Managing Director, Mr. J. G. Clark, stated that the Company's annual expenditure locally amounted to £10,000, and they also had to pay income-tax in the region of £2000. During the past ten years, owing to the fact that they had been in a position to reduce the price of gas to consumers, their output had more than doubled. People were saying that the standard of living had to be lowered, but he did not agree with that view. In his opinion, the standard of living must be maintained, for if they wanted good work they must have good men.

Captain W. J. V. Watts, another Director, said that whenever they picked up a newspaper they saw something about electricity. There was no place where the development of modern science had been more rapid than in America, but although in that country it had to compete not only with electricity but with natural gas, they had the astounding fact that the output of gas in America had doubled.

These remarks were made in responding to the toast of the future prosperity of the Newton Abbot Company, which was proposed by Mr. F. J. Prowse, who presided over the dinner. Mr. Prowse remarked that of the few leading industries which had more or less escaped the world wide depression it would be no exaggeration to say that the Gas Industry had probably suffered the least. It had been said that the best way to encourage employees was to give them a monetary interest in the business, and the Committee which arranged the dinner hoped that in the near future, with its surplus funds, it would be in a position to purchase shares in the Company.

Results in New Zealand.

The Directors of the Wellington (New Zealand) Gas Company submit the following annual report for the year ended Dec. 31, 1931.

The £350,000 mortgage debenture stock, of which £200,000 was issued on Oct. 1, 1921, matured on Oct. 1, 1931. An extraordinary general meeting of shareholders, held on May 8, authorized a new issue of £350,000 at 6½ p.ct., for a period of ten years from Oct. 1, 1931. The Company has the right to redeem the stock at the end of five years by giving the holders six months' notice in writing. Of the present authorized issue for £350,000, the Board decided to issue only £200,000. The new stock was offered to the existing holders, and was largely over-subscribed. A most important work—viz., the second section of the high-pressure 24-in. gas main, from Hamilton Road to Tory Street—is completed. This involved an expenditure of £15,000.

The Directors decided to give consumers the full benefit derived from the reduction in wages, by reducing the price of gas, in August last, by 3d. per 1000 c.ft. During the year eight miles of gas mains were laid, 795 services connected, and 1665 cookers fixed. After payment of the interim dividend of 4 p.ct. on the ordinary shares, the year's dividend on the preference shares, providing for depreciation of plant, buildings, machinery, &c., debenture redemption fund, and insurance fund, the profit and loss balance amount to £27,607, which it is proposed to appropriate as follows: Pay a further dividend of 4 p.ct. (making 8 p.ct. for the year) and carry forward the balance of £16,454.

THE PRINCE OF WALES AT THE FAIR

On Thursday last H.R.H. The Prince of Wales visited the Birmingham Section of the British Industries Fair; and he spent a considerable time in the Gas Industries Section. At the Central Information Bureau he signed the visitors' book, and commented favourably on the exhibit. Our photograph shows him viewing with interest the "Beamo" gas meters on the stand of Messrs. George Wilson Gas Meters, Ltd.

Official Visit of the Juniors.

Last Thursday was chosen for the official visit of the British Junior Gas Associations to the Birmingham Section of the British Industries Fair, and nearly 300 members of the various Associations throughout the country availed themselves of the opportunity of inspecting the exhibits in the Gas Industries' Section. There was no formal meeting, but the Juniors were entertained at luncheon by the Fair Management Committee, when a short Address was given by Mr. J. Herbert Canning, the President of the Institution of Gas Engineers. Apart from the Loyal Toast, the only toast was "The Gas Industry," which was proposed by Mr. J. Percy Plant, Chairman of the Journal and Publicity Committee of the Fair, who presided at the luncheon.

Mr. PLANT, on behalf of the Birmingham Chamber of Commerce and the Board of Management of the Fair, welcomed the Junior Associations and referred to the presence of several overseas visitors, present at the luncheon, from Australia, South Africa, and New Zealand. If they compared the Fair of 1932 with that of the previous year, he thought they would come to the conclusion that a great advance had been made. The standard of the Fair as a whole, and of the corporate and individual exhibits, was higher than ever. The Gas Industry was very progressive, and was growing both in this country and the United States in face of severe competition. There was nothing of the "back number" about gas; the Industry was healthy and vigorous. He was interested to learn that the Junior Gas Associations had been in existence for 25 years. They served an excellent purpose in keeping the younger technical men in the Industry *au fait* with developments in carbonization, distribution, and chemical research; and since there was usually only one gas undertaking in each town, the opportunities of exchange of experience given by the Junior Associations were of particular value to the Gas Industry. He had pleasure in giving the toast of the Industry, and coupling with it the name of the President of the Institution of Gas Engineers.

Mr. CANNING, responding to the toast, expressed the thanks of those present to the Chairman, the Birmingham Chamber of Commerce, and the Fair Management Committee for their hospitality. As the proposer of the toast had said, gas was certainly not a back number. Progress had been made during a period of severe trade depression, and there was no doubt that when a revival in industry took place the Gas Industry would make still greater strides forward. He considered Birmingham an appropriate place for a Gas Industry exhibit and for gas conferences, for Murdoch was employed by the Birmingham firm of Boulton & Watt; and to celebrate the Peace of Amiens he illuminated his firm's foundry by gas in the year 1802. The tradition had been admirably maintained by the Birmingham Corporation; Birmingham was noted for the excellence of its street lighting by gas. And as an Industry they expressed their thanks to the Birmingham Gas Department for their work in connection with the exhibit at the Fair, and, in particular, to Mr. A. W. Smith and Mr. R. J. Rogers. Last autumn he visited both Canada and America; and in the United States, in spite of intense electrical competition, the output of gas had increased by 110 p.ct. during the last ten years; while in Canada the output had grown by 25 p.ct. in the last five years. Thus the progress of gas in Great Britain was by no means a local phenomenon.

Following the toast, Mr. Canning delivered an address which is published in other columns of our issue to-day.

Salesmen's Day.

Friday at the Fair was Salesmen's Day, and the British Gas Salesmen's Circles were well represented at the official luncheon.

Mr. FRANK WAIN (Hon. Treasurer of the Birmingham Chamber of Commerce, who presided, said that the Chamber were very greatly indebted to the Gas Industry for the valuable help which they gave to the Fair in organizing the Gas Industries' Section. He spoke highly of the work of Mr. A. W. Smith, Dr. E. W. Smith, and Mr. R. J. Rogers.

Sir FRANCIS GOODENOUGH, in responding to the toast of the Gas Industry, also paid a tribute to the work of Mr. A. W. Smith and Mr. Rogers in connection with the Fair, and on behalf of the Gas Industry generally.

The question of salesmanship, he continued, was of first-rate interest to all of them. It was of the greatest importance not only to the Gas Industry, but to every other industry in the country. It might be said that the country depended for its prosperity, and, indeed, for its very existence, on the success of selling in the markets of the world. For that reason everything which made for efficiency of salesmanship was of prime importance to everyone of them. They might say that the gas salesman constituted the spearhead of the Industry, and as such needed to be kept sharp and bright. That was really one of the aims of the Gas Salesmen's Circles. He wanted them to remember also that it was on the efficiency of each individual that salesmanship in each industry depended. Every individual must be of the best. "We have got in these later years," said Sir Francis, "too much into the way of depending upon organizations and upon the State itself for trade promotion, when it is on our own individual efforts that we must depend if we are to prosper."

He had always laid great stress on the importance of sound character together with good general education as the foundation of efficient commerce. Beyond character there were items of individual ability which they would need, and he would say that if they remembered five i's as important to selling efficiency, they might do something useful. The first was "interest." A famous philosopher—Montaigne—said no man was

of any use unless he got excited; and a man who could not get excited about his business had no business to be in it. They wanted also to be "inquisitive," and find out all they possibly could about the business in which they were engaged. Then they must not forget the value of "imagination," which enabled them to see the customer's point of view instead of looking at things always through their own eyes. Then "initiative" was a very important quality, which had been defined as doing the right thing at the right time in the right way without waiting to be told. It was one of the most difficult things to cultivate, because it meant very often taking responsibility, and that was not every man's gift. The job of the salesman was to know when to exercise his individual responsibility, and afterwards to justify it to his chief. The fifth and final "i" was the quality of "industry." When Ruskin was told that a young man was promising, he asked if he worked. It was no use being promising if he did not "deliver the goods." Above all let them remember that it depended upon themselves and not on somebody else how they got on. He urged them not to believe in luck, but in their own capacity to get things done.

The toast of the health of Mr. A. W. Smith and of Mr. Rogers was also cordially honoured.

More Optimistic Trade Outlook.

The report issued officially on Monday by the various organizations constituting the National Gas Industry of Great Britain states that the business done and the number of trade inquiries received so far at the Birmingham Section of the British Industries Fair are greatly in excess of those for the corresponding period of last year.

Mr. R. J. Rogers, the Hon. Secretary of the Gas Industries Section, stated:

"My experience in going among the exhibitors is that the trade outlook is distinctly more optimistic than it was at the Fair of 1931, and there are some departments of the trade in which the business has shown a large increase. It is in fact true to say that a good proportion of the exhibitors have expressed themselves quite satisfied with the results obtained to date, and already have intimated their intention of exhibiting at the Fair of 1933, and some of them have asked to be accommodated with increased space."

The Central Bureau

Gas Industries Section

THE ENJOYMENT OF ICE-CREAM LEADS TO AN APPRECIATION OF THE VIRTUES OF GASEOUS HEAT FOR COOLING.

The accompanying photograph shows one of the lounges on the Central Information Bureau for the use of visitors to the Gas Industries Section at the British Industries Fair, Birmingham.

The cost of the bureau has been borne by the British Commercial Gas Association and by members of the "Heavy Sections" of the Society of British Gas Industries. It is difficult, if not impossible, for manufacturers of plant and heavier apparatus to do full justice to their products by taking a stand at the Fair. Some of these manufacturers felt, therefore, that by supporting the central stand of the Gas Industries Section they would be directly serving their own interests, and would be able in some degree to make known their products to visitors and the extent of their activities. This is rendered possible by the special set of photographs of various kinds of gas installations and apparatus which is on view on the bureau and by the fact that industrial salesmen on the stand have been supplied with appropriate data.

Among the firms in the Heavy Sections who have co-operated are the following:

West's Gas Improvement Company, Ltd., Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., W. C. Holmes & Co., Ltd., Whessoe Foundry and Engineering Company, Ltd., British Mannesmann Tube Company, Ltd., Samuel Cutler & Sons, Ltd., Derbyshire Silica Firebrick Company, Ltd., Meltham Silica Fire Brick Company, Ltd., Newton, Chambers, & Co., Ltd., Joseph Taylor (Saturators), Ltd., Thomas Vale & Sons, Clapham Brothers, Ltd., Oughtibridge Silica Fire Brick Company, Ltd., Stewarts & Lloyds, Ltd., Firth Blakeley, Sons, & Co., Ltd., R. & J. Dempster, Ltd., Robert Dempster & Sons, Ltd., Drakes, Ltd., Gas Chambers and Coke Ovens, Ltd., Goodall, Clayton, & Co., Ltd., E. J. & J. Pearson, Ltd., Stourbridge Refractories Company, Ltd., Broadhead Constructions, Ltd., Bryan Donkin Company, Ltd., Mobberley & Perry, F. C. Sugden & Co., Ltd., Geo. Waller & Co., Ltd., Willey & Co., Ltd., E. Cockey & Sons, Ltd., Davison & Partners, Ltd., Oxley Engineering Company, Ltd., Stanton Ironworks Company, Ltd., Chemical Engineering and Wilton's Patent Furnace Company, Ltd., Clayton, Son, & Co., Ltd., Aldridge & Ranken, Ltd.

Gas at the London Section of the B.I.F.

Olympia

The Gas Industry is represented at the London Section of the British Industries Fair by the Gas Light and Coke Company and the South Metropolitan Gas Company, who have interesting stands in the Chemical Section at Olympia.

Gas Light and Coke Company.

The Gas Light and Coke Company's exhibit comprises a stand on which are a number of cases containing examples of some of the many chemical and tar products manufactured by the Company, including pitch, road tar, tar-bitumen compounds, tar emulsions, creosote, naphthalene, phenol, cresylic acid, naphthas, toluol, benzole, pyridine, anthracine, sulphate of ammonia, liquid ammonia, green copperas, and spent oxide. The large variety of tar and bitumen dressings now available for road-dressing purposes is prominently displayed.

An illustrated pamphlet given away on the stand sets forth some interesting figures regarding the scope of the Company and its products, explaining the chief uses of the various tar and ammonia products prepared under modern conditions at the Company's Beckton and Southall Works. In this it is stated that special attention is paid to the production and delivery of a very high grade of distilled tar for the surface dressing of roads, the manufacture of tar macadam, &c. This is supplied in drums. barrels, and rail tanks, while a large fleet of road tanks, fitted with every appliance for delivering tar hot, either to contractors' plants or for spraying direct on to the road, is maintained by the Company.

The lighting of this stand is efficiently carried out by means of high-power strip gas burners, distant controlled by tumbler switches.

"Metro" Products.

The stand of the South Metropolitan Gas Company is striking and attractive, being not unlike a miniature edition of the Crystal Palace in general appearance, in glass and green woodwork, with a glass tower containing high-power gas lamps at each extremity, while the interior is illuminated by panel brackets. Here again, on glass shelves round the stand, are exhibited examples of the many "Metro" tar and chemical products manufactured at the Company's Products Department at the Old Kent Road, S.E. 15. Among these are "Metro" coal tar and ammonia products, heavy inorganic acids, and certain other inorganic materials, creosote oils, road tar pitch, disinfectants, and sulphate of ammonia.

Potterton Boilers.

On the stand of Messrs. Staines Kitchen Equipment Company, Ltd., of 94, Victoria Street, S.W. 1, are three patent "Splendid" crockery washing machines, for which Messrs. Thomas Potterton (Heating Engineers), Ltd., have provided twin "Empire" gas boilers in the form of an insulated and enamelled lagged set. These boilers have a collective hourly output of 76 gallons of water raised through 80° Fahr., while the storage is slightly larger in proportion—viz., 100 gallons capacity to provide for peak load requirements. With Messrs. Staines' sinks the supply is fairly constant, running water being used frequently for sterilizing and rinsing, and in this respect the high temperature at which the system works is a great advantage.

REVIEWS

SAFETY IN THE MANUFACTURE AND USE OF ACETYLENE.*

Extensive collaboration of leading international experts has resulted in an acknowledged and useful contribution to the prevention of accidents in the production and utilization of acetylene. The book is divided into two parts, one dealing with the technical processes in the production and utilization of acetylene, and the incidental accident risks, and the other with the legislative measures adopted in various countries for the prevention of accidents in the manufacture and use of acetylene.

In Part I. the properties, and the storage and transport of calcium carbide are dealt with, and then the properties of acetylene, and the purification of the crude gas, are considered. Then, in turn, are treated the manufacture of acetylene, the installation, equipment, and running of acetylene plant, the storage of gas for use elsewhere, and the utilization of acetylene for lighting, cooking and heating, welding and cutting, and soldering.

The monograph has been compiled to enable all those interested in accident prevention work throughout the world to gain an idea of the most important precautions required in the production and utilization of acetylene, without having to consult the widely scattered international literature on the subject; and here and there it has been necessary to go rather deeply into the underlying theories and the technical problems of acetylene manufacture.

In regard to accident prevention rules the report states that containers for calcium carbide must be perfectly watertight. Oxy-acetylene welded sheet-metal drums are best. Protection against rusting through is the first rule in storing carbide drums; storage in basements is inadmissible. All sparking near carbide stores must be prevented; no naked lights; prohibition of smoking; in no circumstances should soldered drums be opened with the welding burner. Carbide dust must be removed from empty drums and rendered harmless.

Acetylene-air and acetylene-oxygen mixtures have a wide explosive range. The elimination of this explosion risk must, it is emphasized, be the overriding principle in the construction of acetylene plant and the framing of working regulations. In particular the following points are of importance in this connection: Avoidance in the apparatus of pockets from which air cannot be expelled; constructional measures that as far as possible prevent the penetration of air during the feeding and de-sludging of apparatus; working regulations for the same purpose.

Before re-starting, apparatus are always full of air; consequently the penetration of air during working, and above all when the apparatus are being taken to pieces, can never be completely avoided. Hence, whenever an apparatus is re-started, and if necessary whenever carbide has been fed in, all the air, and the gas-air mixture formed in the first few minutes of working, must be safely led off into the open. Hydraulic valves must prevent the return of oxygen into the apparatus. Before taking the apparatus to pieces it must be completely filled with water. No water should be drawn off from frozen apparatus, on account of the possibility of a partial vacuum.

Further, the occurrence of dangerous gas-air mixtures in the generator shed should be avoided by having gasholders of an ample size and a pipe for leading off any unavoidable over-make of gas into the open. In this connection it is also important that care should be taken at all times and in all places to secure strict observance of the regulations concerning the handling of the various types of apparatus, the granule size of the carbide to be used, &c.

Since, in spite of all precautions, the occasional presence of acetylene-air mixtures is unavoidable, the possibility of such mixtures igniting must be excluded; and to this end: No copper should be used for apparatus parts exposed to the action of acetylene, and no use should be made of purifying substances from which free chlorine can be given off.

With falling carbide generators the drop of the carbide

* "Safety in the Manufacture and Use of Acetylene." International Labour Office: Studies and Reports, Series F, Second Section (Safety) No. 5. Published in the United Kingdom by P. S. King & Son, Ltd., Orchard House, 14, Great Smith Street, Westminster, S.W. 1: price 6s.

should be so small that no sparks can arise when it strikes any part of the apparatus.

Bare flames and welding or cutting burners should be kept at a safe distance, normally at least 3 metres, from acetylene apparatus. Frozen apparatus should never be thawed with blow-lamps or glowing iron. Naked lights, or sparking by electric switches, &c., should be avoided in generator sheds.

Above all, by designing apparatus suitably, providing the proper quantities of water, and by ensuring unimpeded interaction of the water and carbide, the temperature should be prevented from rising too high, and so causing carbide particles to become incandescent or the acetylene to polymerize and give off incandescent decomposition products. Excessively high pressure in the acetylene should be prevented as being liable to lead to explosive decomposition, even in the so-called high-pressure apparatus; and there should be water seals between the generator and the separate gasholder.

The precautions required in oxy-acetylene welding and cutting depend largely on the type of work to be done in each case, but the following general rules must always be observed: Acetylene piping, including movable piping, should be kept clean and tight; acetylene piping should not be blown through with oxygen; gas cylinders should be handled carefully, protected against sources of heat, and secured against falling by proper fasteners; the connections between gas cylinders and burners should always be in good order; when not in use, acetylene cylinders, whether full or empty, should be shut perfectly tight; the valve-cap key should be fastened to the cylinder so that it will not be missing when urgently required; protective goggles, and, if circumstances require, protective masks and protective clothing, should be worn during work.

All those who have anything to do with acetylene manufacture or utilization will find this report of extreme value.

CHEMISTRY AT THE CENTENARY MEETING OF THE BRITISH ASSOCIATION.*

This volume is the only complete record of the Proceedings of the Chemistry Section of the British Association at its Centenary Meeting last September. It includes: (1) Sir Harold Hartley's Presidential Address on "Michael Faraday and the Theory of Electrolytic Conduction;" (2) the discussion on the Influence of the Medium on the Properties of Electrolytes; (3) the discussion on the Chemistry of the Vitamins and Related Substances; (4) the Symposium on the British Fuel Problem; (5) the discussion on the Structure of Simple Molecules; and (6) an account of the Exhibits and the Excursion to the Gas Light and Coke Company.

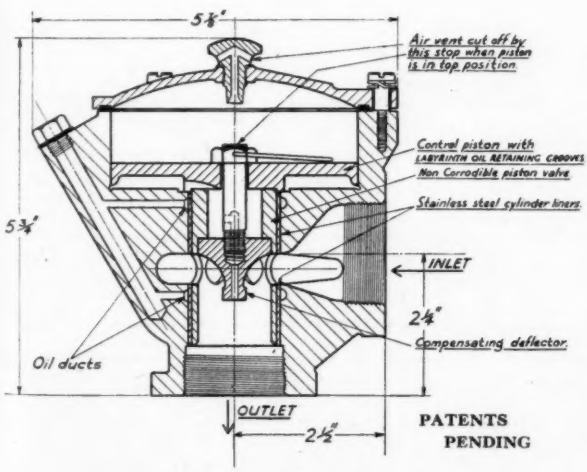
The Organizing Committee of the Chemistry Section undertook this publication in order to give a distinctive character to the Centenary Meeting. Application for copies, accompanied by the necessary remittance, should be made to Mr. J. Davidson Pratt, c/o Messrs. W. Heffer & Sons, Ltd., 104, Hills Road, Cambridge.

* "Chemistry at the Centenary (1931) Meeting of the British Association for the Advancement of Science" Compiled by the Organizing Committee of the Chemistry Section. Published by Messrs. W. Heffer & Sons, Ltd., 104, Hills Road, Cambridge; price 7s. 6d. net.

NOTES ON PLANT AND PROCESSES

"Newbridge" Service Pressure Governor.

After experiments and tests extending over a period of some four years the Horstmann Gear Company, Ltd., of Bath, are able to offer the Gas Industry a new house service pressure governor known as the "Newbridge." The outstanding qualities claimed for this new product are safety, efficiency, and low maintenance cost; and we are informed that it can be manufactured at a sufficiently moderate price to warrant its general adoption in all districts where the mains are of insufficient size to cope with all demands made upon them, at normal pressures.



The Valve is shown in the Full Open Position.

We give a dimensioned section illustration of the "Newbridge" pressure governor. The cast iron body contains two cylinders (each with piston) of different size. The lower or governing cylinder is provided with hardened stainless steel liners, and contains a ported chromium plated piston which acts as the governing valve. Lubrication is automatic from an oil reservoir.

The upper cylinder contains the pressure control piston, which takes the place of the usual leather diaphragm or mercury bell. This piston is oil immersed, and particular attention has been paid to oil retention over long periods without replenishment. In no circumstances can leaks or "blow outs" occur with this type of governor.

Automatic pressure compensation is provided by means of an ejector nozzle so arranged that, as the volume of gas passing through the governor is increased, the governed pressure also increases slightly, to compensate for loss of pressure in the house service pipes. The governor will withstand inlet pressures up to 150 in. W.G.

Labour-Saving Machinery.

Some interesting leaflets published by Messrs. C. H. Johnson & Sons, Ltd., of Smedley Road, Manchester, describe and illustrate some of the thousands of Johnson labour-saving machines for handling all classes of materials, loading, unloading, stacking, conveying, hoisting, screening, and feeding all over the world, together with trench rammers and pipe-laying winches.

The last-named apparatus is of interest, having the advantages of labour saving, safe working, easy handling, &c. A special block and tackle is not necessary, but by means of the lifting gear the load is raised with little effort by one man at each winch. The winch is furnished with a very effective band brake. On steep slopes this winch can also be used for pulling up the pipes, as the legs can be put in any desired position. The pipe laying winch can be carried easily and comfortably by one man. The firm can also supply suitable apparatus for raising and lowering pipes of concrete.

Among the various portable conveyors described is a portable rotary screen, self-contained, and complete with bucket elevator, strong storage hoppers, and with the power unit mounted underneath. In addition, the firm manufacture portable all-steel scraper type conveyors specially designed for handling large and small coal, coke, clinker, oxide, &c.; also self propelling and reversing loaders, which will load at the rate of 40 tons per hour. Johnson's patent automatic feed hoppers are made in any capacities, to suit particular requirements.

Examples of portable power trench rammers are also illustrated, the claims for which include: No subsidence even after heavy rains; no surplus earth to be carried away; reinstatements can be made immediately. The machine can be used for digging trenches and making excavations in addition to ramming back the earth afterwards.

Comparative Working Results of the Three Metropolitan and Six of the Suburban Gas Companies

STATEMENT SHOWING THE WORKING RESULTS AND THE REVENUE ACCOUNT COSTS PER THERM SOLD FOR THE YEAR 1931

Compiled by Mr. F. J. Bradfield, General Manager and Secretary of the Commercial Gas Company

—	Gas Light and Coke.	S. Metropolitan.	Commercial.	S. Suburban.	Wandsworth.	Tottenham.	Croydon.	Lea Bridge.	Hornsey.
Declared calorific value, B.Th.U.	500	560	500	560	470 & 500	500	500	500	500
Gas sold on declared calorific value, therms	245,226,830	95,830,962*d*	18,014,050	22,080,582	25,793,926	17,825,831	15,185,369	5,159,865	4,193,943
Increase, p.ct.	1·45	e·80*e*	0·36	3·49	4·55*k*	2·61	4·04	5·05	2·04
Gas made per ton coal on works tests, therms	74·12*a*	75·19	73·89	74·64	72·10	73·70	74·30	81·28	68·65
Gas unaccounted-for, p.ct.	3·67	0·36	5·39	7·56	3·70	5·34	5·92	3·81	2·25
Coke made for sale per ton coal, cwt.	9·91	9·30	11·09	9·20	9·68	10·74	10·75	10·30	10·88
Tar made per ton coal, galls.	10·35	9·99	9·91	10·04	10·01	11·83	12·43	14·95	12·94
Liquor made per ton coal, galls., 8 oz.	27·61	41·44	39·90	29·95	30·36	31·20	37·69	39·67	40·21
Percentage of coke used as fuel	20·27	22·69	17·84	23·30	19·96	20·81	18·81	21·90	16·34
Capital expended (*less* nominal additions) per therm sold	s. d. 1 10·86	s. d. 1 5·38*f*	s. d. 1 9·04	s. d. 2 1·83	s. d. 2 0·19	s. d. 1 9·55	s. d. 2 4·09	s. d. 1 10·43	s. d. 1 8·87
Capital employed per therm sold	3 3·23	2 0·53*f*	3 1 20	2 5·80	2 5·88	2 2·40	2 8·14	1 11·84	2 2·97
Price of gas per therm { L'day, Mid.	d. * d. 8⅗ 8⅘	d. d. 8¾ 8¾	d. d. 9 9	d. † d. 9½ 9½	d. ‡ d. 7⅗ 7⅗	d. § d. 8⅗ 8⅗	d. ‖ d. 9 9	d. d. 8⅘ 8⅘	d. d. 7⅘ 7⅘
Price of gas per therm { Michs., Xmas	8⅘ 8⅘	8¾ 8¾	9 9	9½ 9½	7⅗ 7⅗	8⅗ 8⅗	9 9	8⅘ 8⅘	8 8
Costs per Therm Sold.									
REVENUE ACCOUNTS.	d.	d.	d.	d.	d.	d.	d.	d.	d.
Coals, oil, &c.	3·28	3·22	3·85	4·73*j*	3·84	4·19	3·88	3·83	4·44
Less residuals—Coke and breeze	1·45	1·47	2·23	1·49	1·76	1·67	1·87	1·33	1·69
Tar	·32	·33	·40	·25	·33	·33	·32	·35	·29
Amm. liq. & sulph. amm.	Loss ·00	·03	·15	Loss ·00	Loss ·02	Loss ·04	Loss ·03	Loss ·05	·01
Total residuals	1·77	1·83	2·78	1·74	2·07	1·96	2·16	1·63	1·99
Net for coals, oil, &c.	1·51	1·39	1·07	2·99	1·77	2·23	1·72	2·20	2·45
MANUFACTURE—									
Salaries	·14	·21	·20	·26	·20	·17	·18	·09	·25
Wages—carbonizing	·37	·59	·48	·47	·43	·53	·31	·41	·46
Purification	·07	·15	·08	·08	·10	·07	·05	·02	·10
Repairs—plant	1·66	1·69	1·49	1·13	1·62	2·08	1·37	1·55	·99
Net manufacture	3·75	4·03	3·32	4·93	4·12	5·08	3·63	4·27	4·25
DISTRIBUTION—									
Wages and salaries	·63	·31	·36	·64	·39	·30	·55	·14	·29
Repairs—Mains and services, &c.	·84	·63	·55	·85	·76	1·23	·94	·78	·75
,, Meters & prep. meters & fittings	·44	·75	·99	·65	·65	·50	·37	·46	·44
,, Stoves—ordinary & prepayment	·75	·56	·90	·59	·51	·47	·61	·95	·25
Total net manufacture & distribution	6·41	6·28	6·12	7·66	6·43	7·58	6·10	6·60	5·98
Rents, rates, and taxes	·55	·33	·47	·11	·29	·59	·53	·72	·29
MANAGEMENT—									
Directors, Auditors, and salaries (Secretary, &c.)	·11	·12	·18	·17	·20	·16	·21	·30	·32
Collectors	·19	·15	·30	·11	·12	·20	·23	·13	·07
Stationery and general charges	·15	·19	·23	·18	·21	·17	·25	·24	·19
Co-partnership	·10	·17	·24	·21	·25	·17	·20	·14	·13
Bad debts	·02	·01	·01	·02	·01	·00	·02	·01	·01
Law and parliamentary charges	·01	·00	·01	·01	·02	·00	·01	·00	·00
Superannuation, pension funds, &c.	·20	·16	·26	·16	·19	·18	·24	·14	·07
National Insurance	·06	·23*g*	·06	·06	·08	·08	·04	·05	·06
Sundries	·01	·01	·01	..	·01	..	·00	..	..
Total expenditure (*less* residuals)	7·81*b*	7·65	7·89	8·69	7·81*l*	9·13	7·83	8·33	7·12
GAS (*less* public lighting expenses)	8·24	8·02	8·36	9·09	7·96	8·54	8·96	8·25	7·72
Rentals—Meter & prep. meter & fittings	·87	·69	·74	·64	·94	·49	·54	·47	·37
Stove	·62	·42	·59	·66	·71	1·49	·59	1·05	·70
Incand. mantle maintenance	..	..	·01	..	·08	..	..	..	..
Miscellaneous	·04	·02	·02	·01	·02	·37*m*	·25	·00	·04
Total—Gas, rentals, &c.	9·77	9·15	9·72	10·40	9·71	10·89	10·34	9·77	8·83
Balance, being profit	1·96	1·50	1·83	1·71	1·90	1·76	2·51	1·44	1·71
Dividend and interest	1·87	1·45	1·94	1·73	1·74	1·65	2·04	1·40	1·34
Surplus or deficit	·09	·05	Def. ·11	Def. ·02	·16	·11	·47	·04	·37
Contributions to funds and sundry payments	·07*c*	·06	..	..	·08	·06	·42	·02	·44
SUNDRIES.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Coals cost per ton	21 0·32	19 9·36	21 11·48	24 9·00	22 11·97	26 4·56	25 1·06	28 4·97	27 9·00
Coke realized per ton coal	10 3·61	8 9·31	12 5·01	10 9·69	10 6·38	11 7·58	13 4·03	12 3·52	13 1·95
Coke ,, ,, ,, coke	20 9·36	19 9·98	22 4·69	24 0·77	21 9·11	21 7·81	24 9·66	23 10·54	24 2·47
Breeze ,, per ton	3 11·18	2 8·49	3 5·78	0 8·41	6 11·65	5 4·08	6 7·69	9 4·72	..
Tar ,, per gallon	0 2·72	0 2·45	0 2·75	0 2·20	0 2·42	0 2·39	0 2·17	0 2·25	0 1·95
Amm. liquor, &c., realized per butt, 8 oz.	Loss 1·77	0 5·06	2 3·11	Loss 0·59	Loss 6·27	Loss 1 1·23	Loss 2·15	Loss 1 3·06	0 2·61
Percentage of stoves at rental to consumers	99	113	103	103	76	83	77	68	40
Bad debts p.ct. on total receipts	·14	·10	·04	·14	·13	·03	·13	·06	·11
Net profit p.ct. on ordinary capital	6·08	6·31*h*	5·46	6·12	8·10	7·50*m*	10·67	8·85	8·78
One-fifth penny variation equals gross	£204,356	£96,456*i*	£18,244*i*	£22,468*i*	£21,495	£14,855	£12,654	£4300	£3495
Water gas p.ct. on total make of c.ft.	24·28	..	0·06	..	16·28	28·87	29·05	31·64	34·66

a—Before benzole extraction.
b—Expenses issue of debenture stock eliminated.
c—*Less* grant from Treasury.
d—Including sales to South Suburban.
e—Excluding sales to South Suburban.
f—Eliminating purchase of South Suburban and Commercial stocks.
g—Including co-partnership insurance fund.
h—Excluding discount on 6½ p.ct. red. deb. stock.
i—One farthing variation on gas charged.
j—Including gas purchased from South Metropolitan.
k—On amalgamated companies' figures.
l—Excluding capital duty.
m—Including electricity results.

ADDITIONAL PRICES:
*—Brentford, ½d.
Grays and Pinner, 3⅝d.
†—Northfleet, 3d.
‡—Wimbledon, ⅜d.
Epsom, 2½d.
Kingston, 1⅝d.
Sutton, 1⅜d. (Michaelmas and Xmas).
§—Waltham and Cheshunt, 4d.
‖—Oxted, 5s. per 1000 c.ft.

ADDRESS TO JUNIOR GAS ASSOCIATIONS

On the occasion of the visit of the British Junior Gas Associations to the Birmingham Section of the British Industries Fair, this Address was delivered by Mr. J. H. Canning, President of the Institution of Gas Engineers

I have to thank you in the first place for inviting me to address this gathering, and I should like to assure you that it gives me the very greatest pleasure to have this opportunity of meeting you.

A very heavy responsibility rests upon the Juniors, inasmuch as they will be called upon in the near future to take up the burden of maintaining the technical and commercial success of the Industry. There devolves also upon the Seniors the reciprocal responsibility of doing all that is possible, by the provision of the necessary facilities and the encouragement of students in every way, to ensure that the future personnel of the Industry shall be fully prepared to undertake the tasks which lie before it.

In former days no scheme of education had been formulated, and the student's path to the goal of his ambitions was often both painful and tedious. To-day, as a result of the excellent work of the Education Committee of the Institution of Gas Engineers, the student is provided with a ladder, the successive rungs of which he may climb with ease and security. He may be confident that, given the necessary intelligence, application, and perseverance, he will be successful in the examinations which certify his possession of the technical knowledge necessary to the efficient practice of his profession.

You are all so familiar with the Education Scheme and with the field of knowledge which it embraces that I do not propose to deal with it in detail. I would, however, suggest that every student worthy of the name should look upon an examination syllabus as a minimum and not as a maximum. It is obvious from the limited knowledge possessed by many of those who have passed modern educational tests, even of a high order, that they have limited themselves severely to the exact syllabus required for the examination they wished to pass. While the student, therefore, should certainly do all that lies in his power to pass these tests, he will be wise if, at the same time, he loses no opportunity of widening his sphere of knowledge.

The necessary knowledge and the accompanying training having been secured, a young man's future success and progress will depend upon qualities which cannot, up to the present, be estimated or valued by any system of examination. The most brilliant educational successes may prove worse than useless unless reinforced by those qualities of mind and character which enable them to be used to the best advantage.

Industry, initiative, reliability, and a capacity for assuming responsibility are necessary if a man is to put his knowledge to the greatest possible use. These qualities are, to some extent, inborn, but are capable of improvement by training and practice. A great deal depends upon early training and, especially, home training. If industrious and regular habits have been inculcated in childhood they will remain throughout life and will prove an immense advantage to their happy possessor. Initiative, on the other hand, is often stifled in the young by well-meant but narrow-minded ideas of discipline. Youth should be taught to think for itself under the careful guidance of those who are more experienced, and when a blunder is made there are other methods of redress than a curt snub or a harsh rebuff. Many a good horse has been ruined by the excessive use of the rein, and many men would have been able to do more for humanity if their initiative had not been crushed at an early stage by petty despots at home or at school. The capacity for assuming responsibility is largely an inborn characteristic, but can be developed by suitable training. This quality is closely allied to strength of character. Young men should accustom themselves to be self-reliant; to stand alone and not to be always seeking shelter or the assistance of others. We should not, of course, despise the help which others can and do give us, but should always realize that there are some things which a man must work out and decide for himself, and that unless he has trained himself in this respect he will inevitably be found wanting when the hour of decision arrives. Sound knowledge and training are indispensable factors in securing the requisite confidence. Cultivate the habit of being a merciless judge of your own work, and if you can secure the approval of that inexorable tribunal you will find it much easier to assume responsibility when the time comes for you to do so. In other words, be thorough in all that you do.

Lord Bacon has said in his Essay on Studies, "Reading maketh a full man, conference a ready man, and writing an exact man," and we should all do well to pay heed to the lessons implied in this pithy quotation.

A wrongly selected course of reading will assuredly fill the mind, but with such a mass of lumber and rubbish as will be of little profit to the possessor. An engineer's reading may be divided into two parts, the necessary and the desirable. It is absolutely necessary to read the Technical Press connected with our Industry in order to keep in touch with all the latest developments, to increase our knowledge, and to keep our minds flexible and receptive. It is desirable that one's early training should cover a course of such English writers as are most likely to awaken in us a sense of the beauty of our language and a desire to emulate them in the correctness and elegance with which they use it. For those who are that way inclined reading may also constitute a valuable recreation, but it may be pointed out that the majority of modern light literature is written in execrable English. If a correct English style has been formed in early life the reading of these modern authors will simply produce a sense of irritation, but there is a danger in other cases that the reader may form his style upon these moderns, with unfortunate results.

A full mind resulting from a well chosen course of reading is an invaluable asset in the conference of which Bacon speaks. An empty headed talker is one of the greatest plagues of humanity.

The sphere of an engineer's usefulness is immensely diminished unless he is able, clearly and intelligibly, to describe and explain his plans and designs to others, and to take part profitably in discussions upon technical subjects. Here again, though much depends upon natural ability, more than is usually supposed to be possible can be achieved by patient practice. If attention is given to the best models; if the speaker will take pains by diligent study to gain clear ideas upon his subject; and if he will persevere, in spite of occasional discouragements, in practising the art of speaking, he will nearly always achieve success.

Among the essentials to good speaking, clear thinking undoubtedly stands first. It simply means that a man must understand his subject and that his ideas with respect to it must be marshalled in proper order in his mind. The mind is to the speaker's voice what the gramophone record is to the sound reproducing apparatus. Unless the disc is impressed with the record of the sounds in their proper sequence and order, the result is unintelligible discord, and a speaker who has not taken pains to clarify his ideas is in danger of producing a similarly unfavourable impression.

Clear thinking is even more necessary when it comes to writing, if one is to attain the exactitude of which Bacon speaks; and it may be added here that clear thinking, writing, and speaking, in the order given, form a sequence which the student would be well advised to follow. Let him first get clear ideas about his subject and then proceed to put them into writing. Then let him go over what he has written, omitting the superfluous, and deleting what is incorrect or inexact. Then, when he has finally set forth his ideas correctly, clearly, and concisely, he will undoubtedly be in the best possible position to speak upon them.

Writing is also one of the greatest aids to memory, and, for this reason, students should keep notes of their studies, their experience, and of all technical and other data which will be useful to them in their career. Do not be content to accept the data given in books. Experiment for yourself and collect your own data. You will often be surprised to find how greatly the figures obtained by you in actual practice differ from the standard data, which are often copied from one text-book into another, without inquiry or verification. You cannot standardize Nature; her phases are infinite, and every new project presents its own special problems. The best engineer is he who realizes this fact from the commencement.

There is one other quality not hitherto mentioned which is indispensable to success. When I was in Canada and

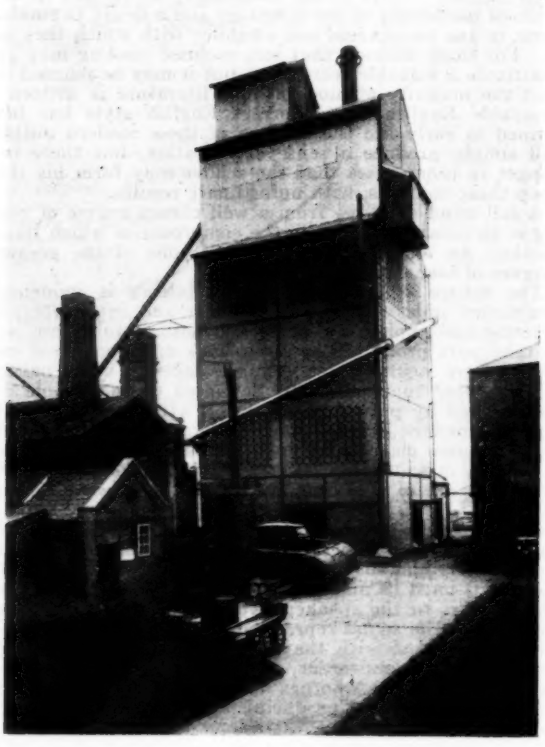
the United States last autumn I was told that in selecting recruits for the Gas Industry over there they did not necessarily look first for intellectual brilliance, or the other qualities I have mentioned above, but for enthusiasm. If enthusiasm were lacking they felt that no other excellence could compensate for the defect. The reason for this is that enthusiasm makes work a pleasure and enables one to make more progress in a few short years than, otherwise, would be possible in a lifetime.

We have a striking example of this in the career of one who, unfortunately, has been too early taken from us. I refer to the late Sir Arthur Duckham, whose brilliant success was so largely due to the enthusiasm and optimism which he threw into his work. As a result he has accomplished more for his country and for our Industry within his all too short span of life than could have been accomplished collectively by a score less enthusiastic men. His memory will remain as an inspiration to all of us.

STOURPORT GAS-WORKS*

Ancient and Modern

Stourport has been associated with the Gas Industry almost from the beginning; in fact, soon after Murdoch built the first gas-works at the Soho Foundry, Smethwick. The first gas-works in Stourport was built by the Baldwins, the ancestors of Mr. Stanley Baldwin, on the site of their original foundry, which is still in operation,



The Glover-West Vetical Retort-House at Stourport.

turning out cast-iron hinges, hollow-ware, &c., as for many years past. The original gas-works at this foundry was built to supply light for the works; but, as time went on, the town was also supplied from the same source, and it is common knowledge locally that the old wooden bridge over the Severn at Stourport was lighted by gas before London Bridge. It is also stated that the main gas supply to the town from the foundry passed through the house of the then head of the firm, who considered that ten o'clock at night was time for everyone to go to bed, and who, therefore, saw that the gas supply was turned down nightly from his house at that hour.

It is interesting from a historical point of view that many of the service-pipes used by this old gas-works were in cast-iron from ¾ in. diameter and upwards. They were in 3-ft. lengths with sockets and spigots, and the earlier ones were jointed with swarf or fine borings. Those of a later date also had sockets, but the spigots and sockets were threaded. The photograph of an old syphon pot, taken out in 1930, is interesting; it is, no doubt, one of the oldest gas syphons in existence. The body is most likely cast from the pattern of a cast-iron utensil then produced at the foundry.

* From "West's Gas."

The Original Company.

This old gas-works of the Baldwins supplied gas to the town until 1866, when the Stourport Gas, Coal, and Coke Company, Ltd., was formed, and the present works on the banks of the River Severn was built. From 1866 to 1872 both works supplied gas to the town, but in the latter year all the mains, services, meters, and gas interests generally outside the foundry were bought out by the Stourport Gas, Coal, and Coke Company.

From 1872 onwards progress was steady, and about the year 1892 four Klönne regenerator horizontal retort settings were installed and did very good service until the demand for gas outgrew the capacity of the plant. The situation was eased in 1920-21 by installing a complete gasification plant. This proved a good investment as, for

A Curious Old Syphon Pot from the Original Distribution System at Stourport.

a comparatively small outlay, extensions to the carbonizing plant were put off at a time when prices were at their highest—just in the "boom period" after the Great War.

The Present Company.

In 1919, the Stourport Gas, Coal, and Coke Company, Ltd., obtained its own Act of Parliament, when the name of the Company became "The Stourport Gas Company."

In 1926 carbonizing plant extensions were again an urgent consideration, but were postponed owing to the

introduction of electricity into the town, the supply coming from one of the super-power stations just erected a few hundred yards from the gas-works.

New Carbonizing Plant.

At last, early in 1931, it became imperative to settle on new carbonizing plant. Various systems were considered and the Directors finally decided to install Glover-West vertical retorts. The new carbonizing plant consists of four Glover-West vertical retorts of the 40 in. New Model type, arranged in one line, so that each individual retort comprises a complete setting in itself, operated independently of its fellows. The plant is fully equipped with furnace fittings, gas, tar, and liquor controls, pressure and temperature indicators and recorders, and two step-grate producers, one to act as a stand-by to the other, and each capable of supplying fuel gas to six retorts, so that a 50-p.ct. extension may be added to the present installation without disturbing the producers. Access to all parts of the plant is obtained by convenient and adequate staircases, ladders, and platforms.

The installation is complete with a waste-heat recovery plant to utilize the residual heat of the waste gases of the retort bench, and consists of a Spencer-Bonecourt vertical, natural-draught waste-heat boiler arranged at the top-of-stack level, and capable of raising 1300 lbs. of steam per hour when the four retorts are in operation.

The installation is built upon a mass concrete raft on a site previously occupied by a coal store and rest room, and is located in such a manner as to allow ample space for future extension. The existing retort house is converted into a new coal store.

A. S. F.

Plant Yields and Estimated Costs

Contributed by Thomas Johnston

Bye-product costing systems follow the crude material through the various plants until the finished product is reached. Unfortunately for the accountant, however, chemical works have an uncomfortable habit of carrying variable and often large stocks of intermediate products, and some method of calculating the probable yields from those intermediates must be devised if accurate costs for finished products are to be obtained.

For example, it is not unusual for a chemical works to start a month with, say, 100,000 gallons of crude oil on hand which should normally go through, say, four plants before the finished product is reached. At the end of the month the cost clerk possibly finds that 25,000 gallons have been fully treated, that 50,000 gallons have only been taken through two plants, and that the remaining 25,000 gallons have been taken through all four plants and through the last one twice.

It is obvious that, where intermediates are produced, used, and stocked, the cost of any process per gallon of production is no indication of the cost of that process per gallon of finished product except in the case of the final plant. As a consequence, many firms who carefully calculate and criticize each individual plant's efficiency are content to compare labour and maintenance costs month by month on the basis of intermediates produced, and are satisfied with a cost per gallon of finished product obtained by the arduous method of pricing all intermediate stocks.

The chief objections to costing by pricing intermediate stocks are that the current period's costs are always affected by the preceding period's costs, and that the system does not lend itself readily to estimating costs of production using any given material.

The following system has been found to yield very satisfactory results and has the advantage of simplifying the preparation of estimates.

(1) All intermediate processes are costed, not on the intermediate produced, but on the finished product which will ultimately be made from that intermediate. The estimate of the ultimate finished product can be based on the current plant yields.

(2) No raw material is charged against any one plant. The actual material cost of the finished product is obtained separately from the cost per gallon for each process through which it passes.

Let us take, for example, the extraction of tar acids from carbolic oil. This can be conveniently costed in two parts:

(1) Extraction of wet crude tar acids.
(2) Distillation of wet crude tar acids.

The original crude carbolic oil will yield, say, 68 p.ct. washed oil and 30 p.ct. wet crude tar acid, and on distillation the wet crude tar acids will probably yield 80 p.ct. distilled acid, 10 p.ct. acid pitch, and 10 p.ct. water.

The actual yield from original oil is:

	P Ct.
Distilled acid, 80 p.ct. of 30 p.ct.	= 24
Washed oil	= 68
Acid pitch, 10 p.ct. of 30 p.ct.	= 3
Loss	= 5
Total	100

and the material cost of the distilled acid can be arrived at as follows:

		d.	d.
100 gallons carbolic oil at, say, 4d.			= 400
Less 68 gallons washed oil at, say, 3·5d.	=	238	
,, 3 ,, acid pitch at, say, 2d.	=	6	
,, 5 ,, loss	=	*Nil*	244
24 gallons distilled acid at 6·5d.	=		156

The cost of distillation is naturally based on the actual production of distilled acid measured from difference in stocks and allowing for sales, transfers, &c.

Owing to variations in the stock of wet crude tar acids kept, it is not accurate to charge your total extraction cost against the finished acids produced; neither should the extraction cost be based on the wet crude acids produced, but on the finished acid which will ultimately be distilled from that wet acid.

e.g., say 100,000 galls. of oil were washed, but only 10,000 galls. of crudes were distilled, the data would be:

Washed oil	68,000 galls.
Wet crudes produced	30,000 ,,
Wet crudes used	10,000 ,,
Finished acid produced	8,000 ,,

The extraction cost would be based on the equivalent distilled acid ultimately obtained from the crudes produced, or 80 p.ct. of 30,000 gallons = 24,000 gallons, and the total cost per gallon of distilled acid would be:

	Pence per Gallon.
(1) Material cost	= 6·5
(2) Extraction ,, $\frac{\text{total cost}}{24{,}000}$	= ..
(3) Distillation ,, $\frac{\text{total cost}}{8000}$	= ..
(4) Re-distillation ,, (if any)	= ..
	..
(5) Distribution ,,	= ..
Total cost	= ..*

* Total general oncost included = ..

When estimating for chemical works products, it is usually better to take plant costs and yields over a fairly long period—say, one year. The most variable factors are the costs of crude material and the value of bye-products and residues. With the method outlined above, it is possible to calculate fairly rapidly the effect a change of price of material or of bye-product will have on the cost of the finished product.

This system has also been applied to the recovery of rectified naphthas, &c., and will be found serviceable wherever one material undergoes several processes and variable stocks of intermediates are kept on hand.

TEN YEARS OF THE - - THERM - -

An Address given to-day to the Joint Gas Conference at the British Industries Fair, Castle Bromwich, Birmingham, by W. J. A. Butterfield, M.A., M.Inst.Gas E., F.I.C.

The Fourth of August is perhaps the saddest of all anniversaries to the present generation, and few people associate it with any other event than the declaration of war in 1914. Owing to its propinquity to the beginning of the Parliamentary Recess it has become a day on which very many Acts of Parliament have received the Royal Assent, and it therefore happens that both the London Gas Act, 1905, and the Gas Regulation Act, 1920, are dated August 4. The first of these Acts introduced testings of calorific value of the gas supplied by the three London Gas Companies, who were, however, placed under no obligation in regard thereto. Between 1905 and 1920 a remarkable development occurred through the recognition of the fact that the value of gas to the consumer depended primarily on the units of heat which it would afford. A Report to the Board of Trade by the Fuel Research Board, dated Jan. 29, 1919, recommended that the gas consumer should be charged for the actual thermal units supplied to him in the gas which passes through his meter, and the Gas Regulation Act, 1920, gave legislative effect to this recommendation.

The Therm.

August 4, 1920, is therefore the birthday, as a legal commercial standard, of the "Therm," or gas unit of heat, which represents 100,000 British Thermal Units. It rests

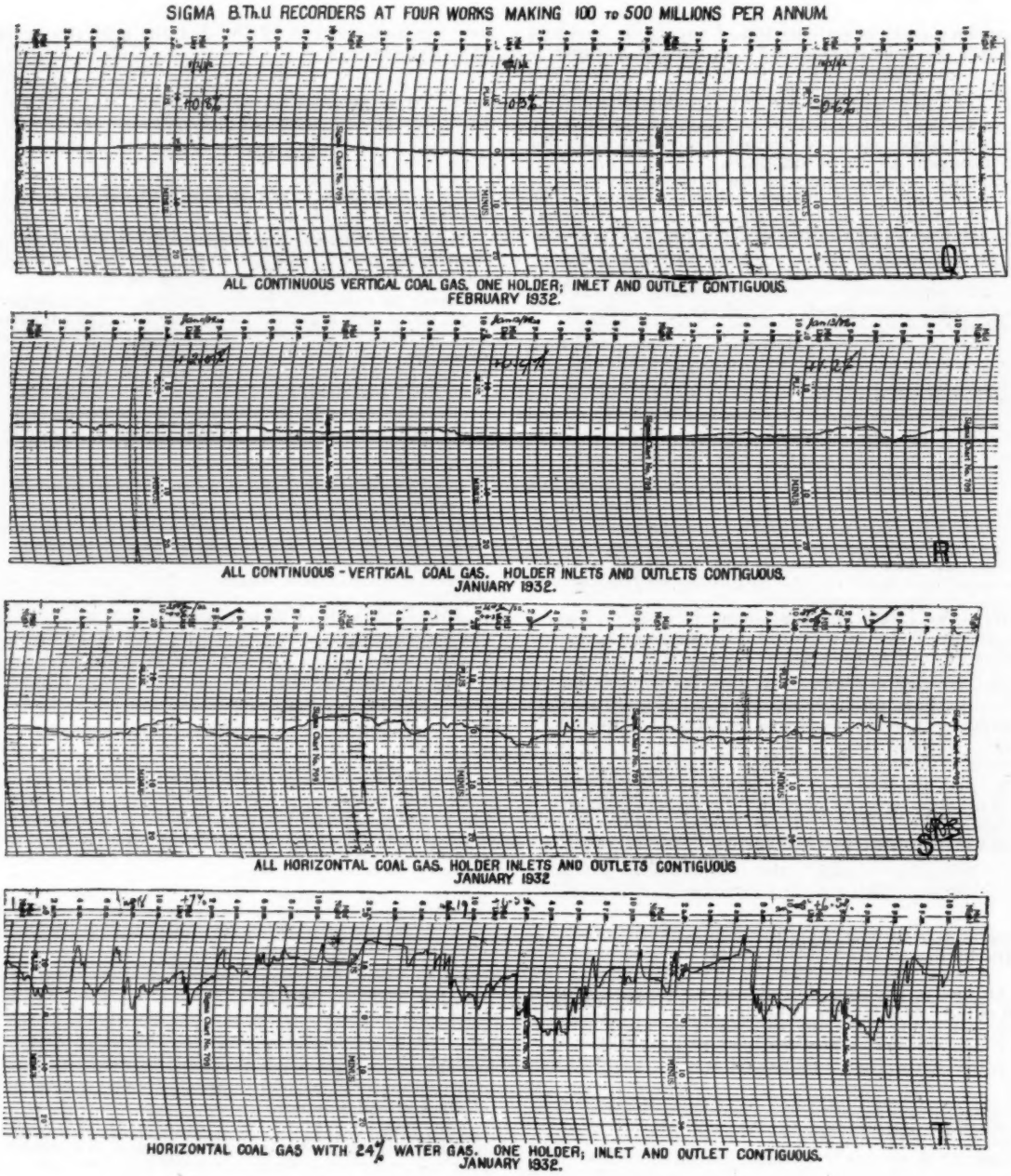

SIGMA B.Th.U. RECORDERS AT FOUR WORKS MAKING 100 TO 500 MILLIONS PER ANNUM.
ALL CONTINUOUS VERTICAL COAL GAS. ONE HOLDER; INLET AND OUTLET CONTIGUOUS. FEBRUARY 1932.
ALL CONTINUOUS - VERTICAL COAL GAS. HOLDER INLETS AND OUTLETS CONTIGUOUS. JANUARY 1932.
ALL HORIZONTAL COAL GAS. HOLDER INLETS AND OUTLETS CONTIGUOUS JANUARY 1932
HORIZONTAL COAL GAS WITH 24% WATER GAS. ONE HOLDER; INLET AND OUTLET CONTIGUOUS. JANUARY 1932.

FIG. 1.

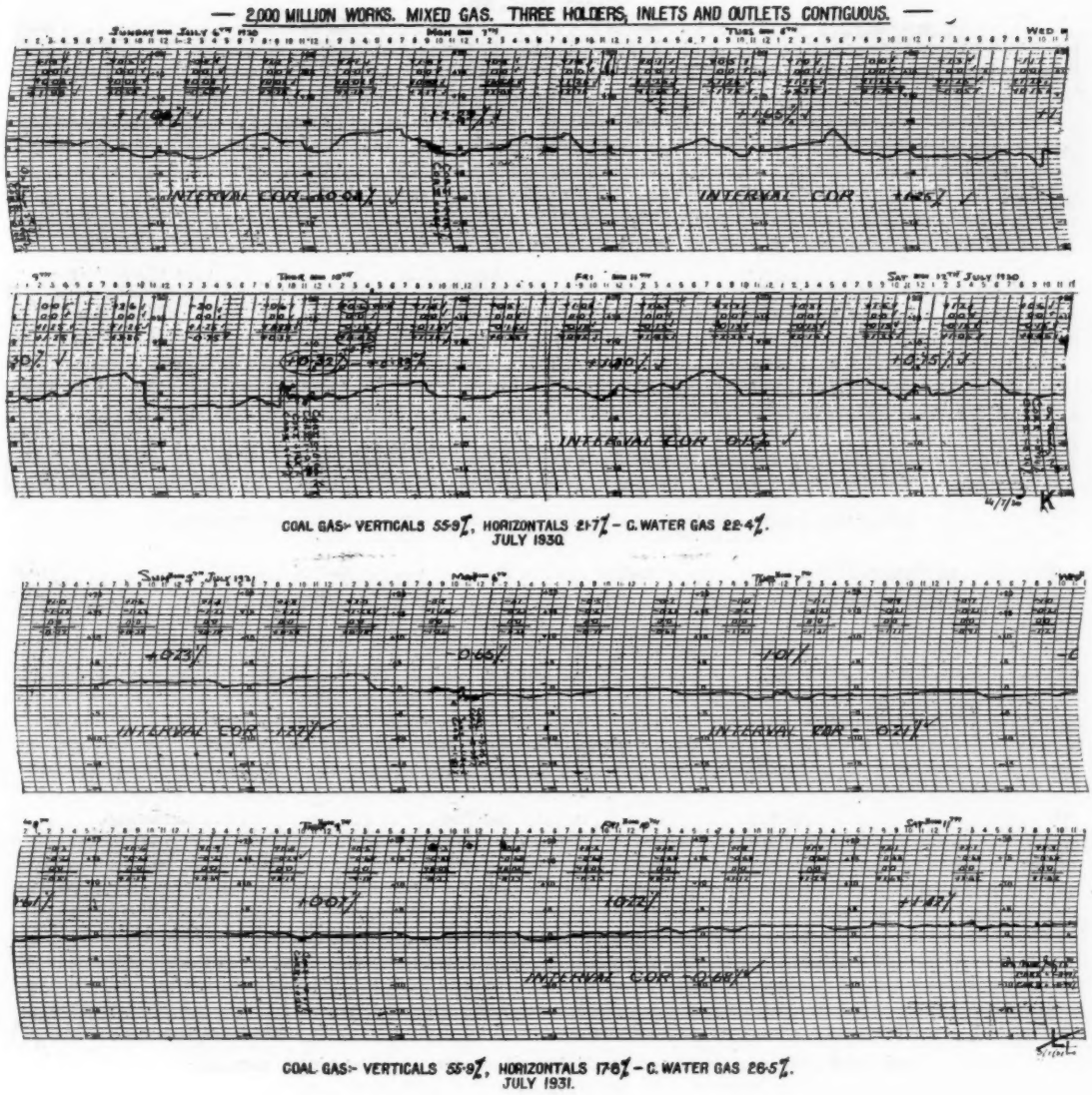

— 2,000 MILLION WORKS. MIXED GAS. THREE HOLDERS, INLETS AND OUTLETS CONTIGUOUS. —
COAL GAS:- VERTICALS 55·9%, HORIZONTALS 21·7% – C. WATER GAS 22·4%.
JULY 1930.
COAL GAS:- VERTICALS 55·9%, HORIZONTALS 17·8% – C. WATER GAS 26·5%.
JULY 1931.

FIG. 2.

with each gas undertaking to decide how many "therms" it will embody in each 1000 c.ft. of gas as measured to the consumer by his meter, but the decision once made becomes a legal obligation until varied by three months' formal notice of the change. Thus it comes about that when his meter registers a consumption of 1000 c.ft. at Evesham the consumer is charged for 6 therms, whereas at Nuneaton he is charged for only 2 therms. The presumption underlying these differences is that with appropriate appliances 1000 c.ft. of Evesham gas will, by reason of its three-fold calorific value, render the same service to the consumer as 3000 c.ft. of Nuneaton gas.

The validity of this presumption has been debated *ad nauseam*, but with some possible reservation as regards the extremes in either direction which Evesham and Nuneaton represent, it is now accepted as a well established fact. The liberty accorded to the gas undertaking to choose the calorific value (*i.e.*, B.Th.U. per c.ft., and, by inference, the therms per 1000 c.ft.) of the gas which it supplies is intended to benefit the consumer also by conducing to the sale of "therms" at the lowest possible price when advantage is taken of local conditions of coal supply, demand for coke, &c. There are, however, no fewer than 27 different calorific values now "declared" by gas undertakings in Great Britain, and it is worth while recording that the Fuel Research Board in its Report in 1919 proposed that burners in gas appliances should be standardized for a limited number of calorific values—viz., four. The standards then suggested, 400, 433, 466, and 500 B.Th.U. per c.ft., would need modification if the proposal were now adopted, because very little gas of as low a calorific value as 400 B.Th.U., is supplied, while there is a substantial proportion as high as 560 B.Th.U. Table I. shows the position at the present time.

TABLE I.—*Sales of Gas in Great Britain at Different Declared Values.*

Number of Gas Undertakings Selling by the Therm in 1931 = 705.
Total Therms sold by them in 1930 = 1,380,488,768.

Declared Calorific Value.	Allocation to Different Declared Values of:	
	Undertakings.	Therms Sold.
B.Th.U. per C.Ft.	P.Ct.	P.Ct.
400 and lower	3·85	1·00
410 to 430	7·65	2·80
440 ,, 460	29·50	14·45
465 ,, 480	22·20	29·10
490 ,, 510*	33·75	43·05
520 ,, 540	1·80	1·05
550 ,, 560	0·95	8·50
600	0·30	0·05
	100·00	100·00

* Includes one at 511·8.

CATEGORIES OF DECLARED VALUES.

The sale of gas in this country otherwise than by the therm is now limited to non-statutory gas undertakings and those statutory undertakings which sell less than 20 million c.ft. per annum. Consequently, fully 95 p.ct. of all the gas supplied is now sold by 705 undertakings which are required to charge by the therm, and it will be seen from Table I. that 95 p.ct. of this gas falls into one or other of four categories or standards of calorific value. Of these the most important is 500 B.Th.U. (or thereabouts) per c.ft., which is the declared value (± 10) adopted by

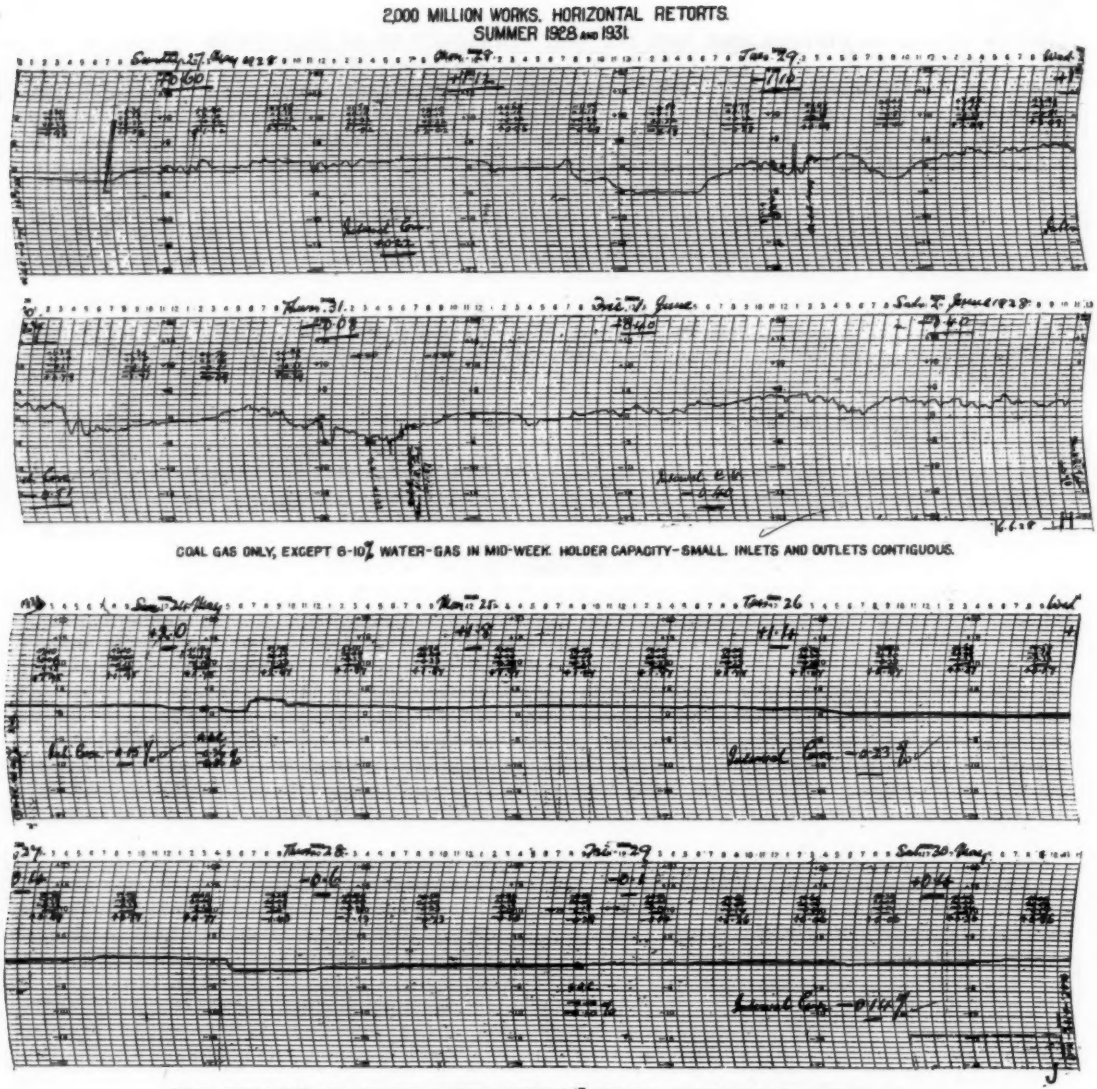

2,000 MILLION WORKS. HORIZONTAL RETORTS.
SUMMER 1928 AND 1931.
COAL GAS ONLY, EXCEPT 6-10% WATER-GAS IN MID-WEEK. HOLDER CAPACITY-SMALL. INLETS AND OUTLETS CONTIGUOUS.
THREE YEARS LATER. COAL GAS ONLY. HOLDER CAPACITY 50% GREATER. INLETS AND OUTLETS CONTIGUOUS.

FIG. 3.

33·75 p.ct. of the 705 undertakings. Gas of this value accounts for 43·05 p.ct. of all the therms sold. Next in magnitude of therm-output are the 22·2 p.ct. of the undertakings which supply 29·10 p.ct. of all the therms at a value round about 470-475 B.Th.U. per c.ft. At still lower values of about 450 B.Th.U. per c.ft., some 14·45 p.ct. of all the therms are sold by 29·50 p.ct. of the undertakings. At the higher calorific value of 560 B.Th.U. per c.ft., 8·5 p.ct. of all the therms are sold. Though 0·95 p.ct. (7) of the undertakings have declared 550 or 560 B.Th.U., five of the seven are small, and practically the whole of the gas of this grade is sold by the South Metropolitan Gas Company and its associate, the South Suburban Gas Company. These two Companies offer to their consumers appliances standardized to utilize gas of this calorific value with the best effect, and with such non-adjustable appliances these consumers have no temptation to experiment with adjustments—to their ultimate disadvantage in nine cases out of ten.

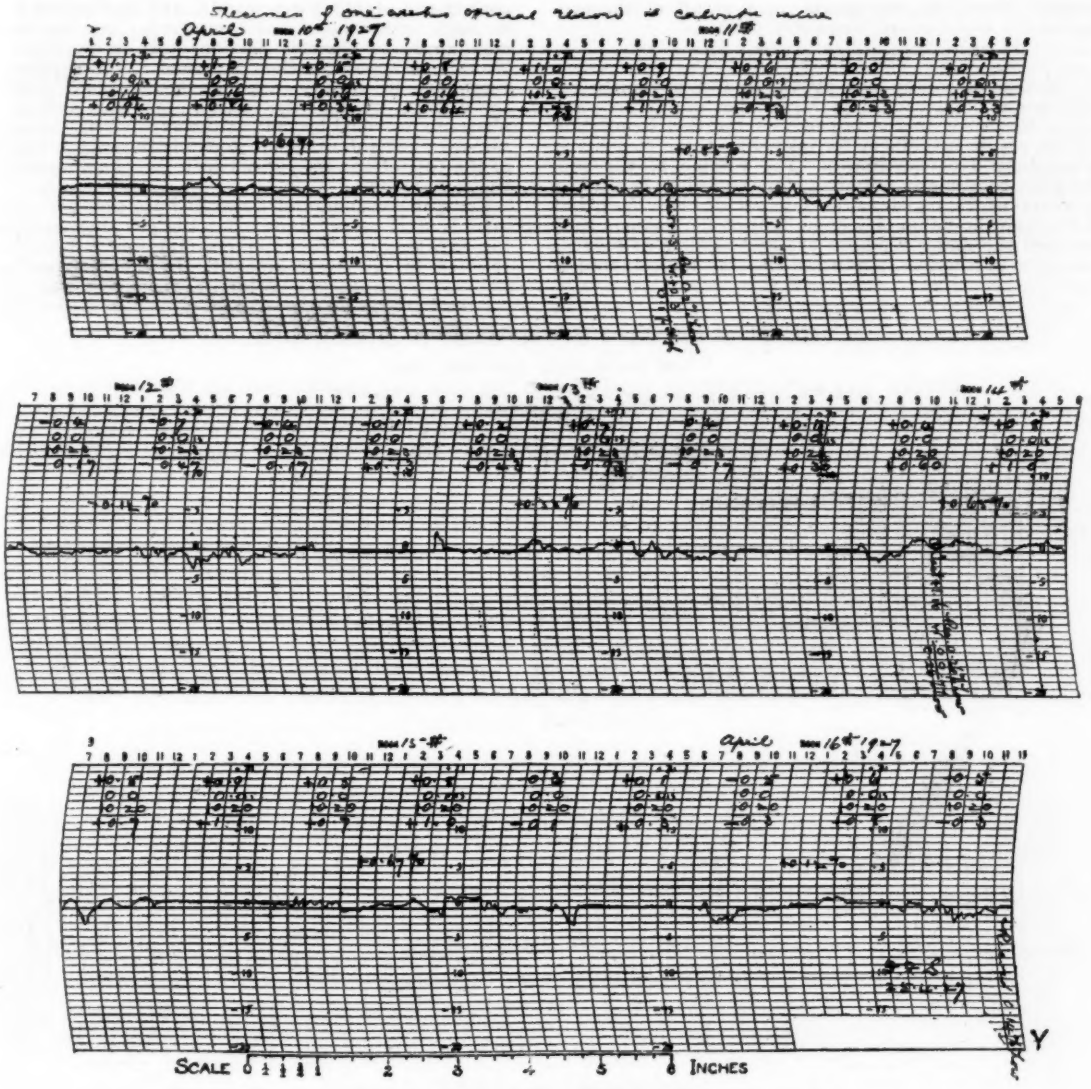
Unification of Declared Values.

If the Gas Industry thinks it opportune to revive the proposal of the Fuel Research Board, it is evident that gas appliances should be standardized for values of 450, 475, 500, and 560 B.Th.U., and it might be practicable to reduce the appliances to three standards by merging all the values between 440 and 480 B.Th.U. To render such a scheme really effective, the undertakings which have declared values which do not fall within either of these groupings would have to revise their declarations, and alter their works practice accordingly. Another point deserving attention is that consumers of small undertakings should be able without detriment to use appliances standardized for the gas of the larger undertakings in the vicinity. That is to say, standardization of appliances for the whole of a large area appears eminently desirable.

TABLE II.—*Net Results of Alterations of Declared Calorific Value.* (*Great Britain.*)

Declared Calorific Value.	Number of Declarations (Undertakings or Areas) at End of 1931.	Alterations of Declarations.		Net Final Results of Alterations.	
B.Th.U. per C.Ft.		Gains.	Losses.	Gains.	Losses.
200	1	1	..	1	..
280	..	..	1	..	1
320	1	..	..	..	..
375	1	..	1	..	1
390	1	..	..	..	..
400	23	2	5	..	3
410	3	..	1	..	1
420	7	1	1	..	..
425	33	5	8	..	3
430	11	2	2	..	..
440	12	..	..	..	..
450	167	11	36	..	25
460	29	5	9	..	4
465	2	..	..	..	..
470	33	10	7	3	..
475	76	20	13	7	..
480	45	6	8	..	2
490	3	..	1	..	1
500	231	53	21	32	..
510*	4	..	..	..	..
520	3	1	1	..	..
525	6	5	1	4	..
530	1	..	2	..	2
540	3	1	1	..	..
550	4	..	6	..	6
560	3	3	1	2	..
600	2	..	..	..	..
Total .	705	..	..	..	..

* Includes one at 511·8.



ONE WEEK'S OFFICIAL RECORD OF CALORIFIC VALUE.

FIG. 4.

That much has already been accomplished towards unification of declared calorific values during the past ten years is indicated by the trend of the alterations which have taken place in that period. Several of these alterations have ensued on amalgamations of undertakings; the smaller one usually changing to the declared value of the larger. Other alterations have been dictated by the results of the first two or three years' experience in operating manufacturing plant to produce gas which conforms to definite obligations in respect of calorific value. Other changes have resulted from the introduction of more modern types of plant on the works. The net result of the alterations (disregarding intermediate declarations) has been that 90 undertakings are now working to a higher declared calorific value than at first, while only 35 are working to a lower value than that which they declared in the first instance. The net gains or losses to the principal declared values are shown in Table II.

It will be seen from this Table that in respect of all the original declarations below 470 B.Th.U., there has been a net loss of 37, with a corresponding gain to declarations of 470 and upwards. The increase in the number of undertakings subscribing to 500 B.Th.U. is very marked, and among the undertakings which have gone over to this value from their original declarations are some of the largest in the country. The net gain of two undertakings to the declared value of 560 likewise has great significance in view of the magnitude of two of the three Companies which now subscribe to it.

Annual Accessions to the Therm Basis.

The present declared values of the undertakings which have been selling by the therm for nearly ten years past may be regarded as more or less stabilized until economic conditions sensibly change; but a large number of undertakings have as yet had only one or two years' experience of supplying gas to a declared calorific value, and revision of the declarations of some of these seems not improbable in the near future. In this connection it is interesting to note the number of undertakings which have been authorized year by year to sell gas by the therm from 1920 to the present time. The figures are given in Table III., which refers to original declarations, several of which have since been superseded or become inoperative through amalgamations of undertakings. It will be seen that in round figures 520 undertakings were charging by the therm at the close of 1924, and additions to this number came slowly until 1930, when the balance of statutory undertakings selling more than 20 million c.ft. of gas per annum were

Table III.—*Total Authorizations of Charges by the Therm.*

Year.	Number of Undertakings.
1920	1
1921	169
1922	146
1923	134
1924	71
1925	18
1926	15
1927	10
1928	8
1929	15
1930	124
1931	1
Total . .	712

Some of these authorizations have subsequently been merged owing to amalgamations of undertakings.

empowered to sell by the therm, as a result of the provisions of the Gas Undertakings Act, 1929.

Measurement of the Therm.

The system of selling gas by the therm obviously envisages means of ascertaining the number of therms passing from the seller to the buyer, and the Gas Regulation Act, 1920, set up machinery for providing these means and ensuring their trustworthiness. The volume of gas supplied to the consumer's premises is measured as heretofore by a meter which registers the number of cubic feet, but until the calorific value of a cubic foot of the gas has been ascertained the meter readings are meaningless as regards the number of therms supplied. The gas undertaking is under statutory obligation to provide suitable apparatus for ascertaining the calorific value, and a suitable place or places for the use of such apparatus. Quite apart from any testings of calorific value which are carried out by the technical staff of the gas undertaking, statutory provision is made in the Gas Regulation Act, 1920, for independent testings on behalf of the gas consumer by competent and impartial Gas Examiners.

Official Gas Examiners.

These Examiners may be appointed by the Borough, Urban District, County Council, or Quarter Sessions (or, in Scotland, the Sheriff) of every district in which any consumer's premises are situate, and in districts for which no such appointment has been made, any five consumers may apply to Quarter Sessions (or, in Scotland, to the Sheriff) to appoint a Gas Examiner. The expenses of the Examiner are in any case met by the Local Authority of the district, whereas the testing apparatus and the testing place are provided by, and at the expense of, the gas undertaking. The intention obviously is to make a fair division of the cost of gas testing between the gas undertaking and the ratepayers.

The gas consumers of Great Britain pay over 50 million pounds sterling per annum for the gas they consume, and the expenses of gas examiners represent a trifling sum in relation to this large amount. In the Metropolitan area they are, from the consumers' standpoint, about 1s. for every £100 paid for gas, corresponding with an insurance premium of 0·05 p.ct. Since, however, they are a charge on the rates, they may alternatively be expressed, from the ratepayers' standpoint, as a charge of about 0·025d. in the £ on rateable value. The extension of the use of recording instruments is leading in many cases to a reduction in the fees for gas testing. In less densely populated areas the expenses are relatively greater, but should very seldom exceed double the above figures.

The gas supplied to about 84 p.ct. of the consumers in Great Britain is now tested continuously, or at more or less frequent intervals, for calorific value, purity (freedom

SPECIMEN OF ONE WEEK'S OFFICIAL RECORD OF CALORIFIC VALUE.

SAME TESTING PLACE. FOUR YEARS LATER.

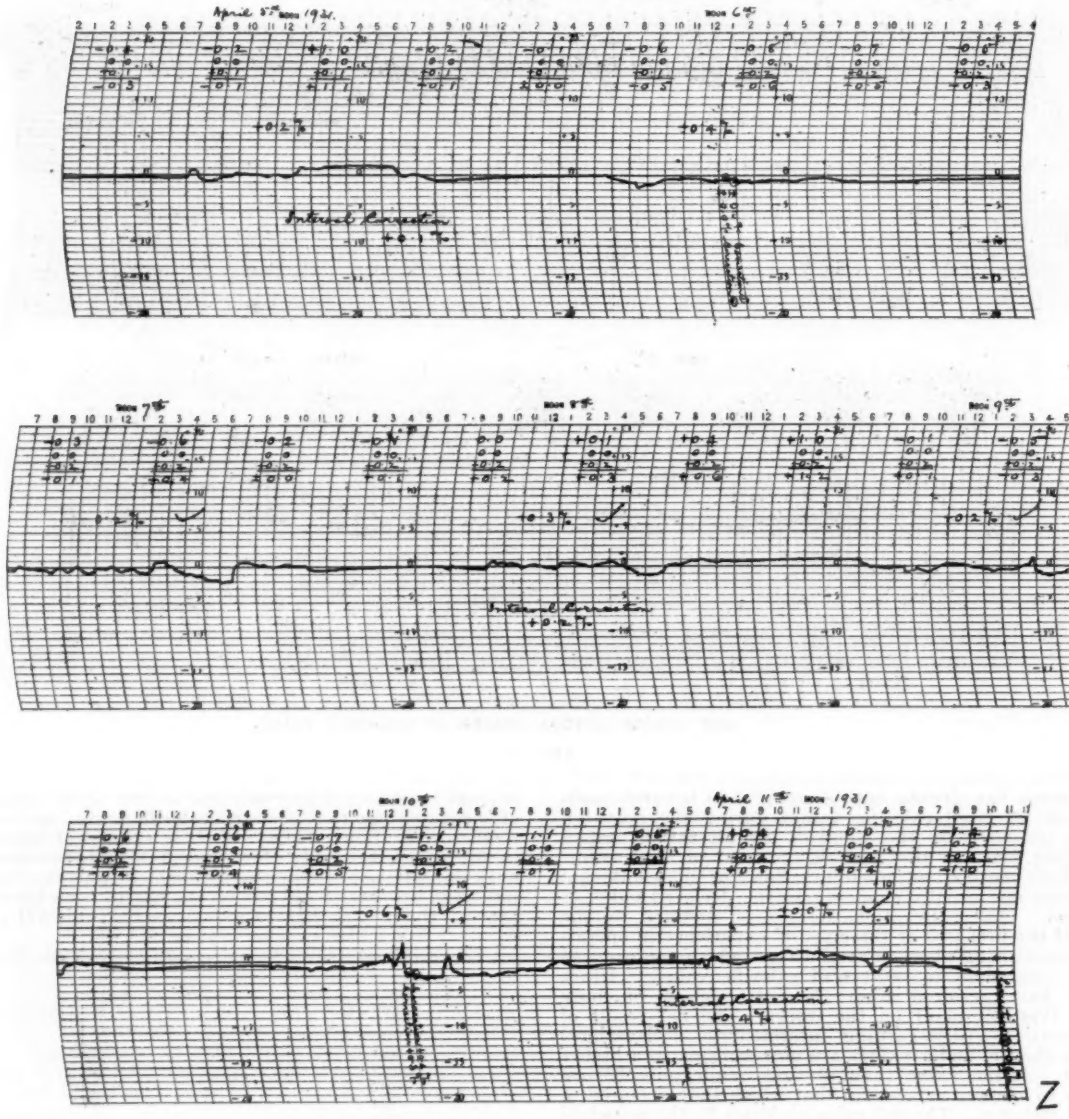


FIG. 5.

from sulphuretted hydrogen), and pressure. The remainder of the supplies are not tested at the present time because consumers have not yet exercised their right to apply to Quarter Sessions (or the Sheriff) to appoint Gas Examiners. The only Borough areas of more than 50,000 inhabitants, for which Examiners are still wanting are: Aberdeen, Barnsley, Blackpool, Bootle, Bradford, Burnley, Cambridge, Carlisle, Coventry, Darlington, Doncaster, Gateshead, Gillingham, Huddersfield, Hull, Leicester, Leyton, Lincoln, Luton, Middlesbrough, Newcastle-upon-Tyne, Paisley, Rochdale, Stoke-on-Trent, Sunderland, Wallasey, Walsall, Warrington, West Bromwich, and Wolverhampton.

Gas Referees.

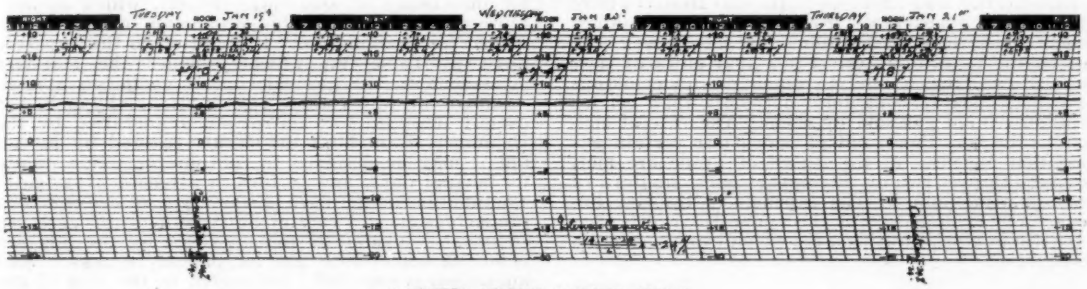
"The places and times at which and the apparatus and method by which tests, whether continuous or intermittent, shall be made to ascertain whether any undertakers . . . are supplying gas in accordance with their obligations, and the method by which any such apparatus shall be verified" are prescribed by three persons appointed by the Board of Trade to act as Gas Referees (*vide* Gas Regulation Act, 1920, Sections 4 and 5). The gas undertakings are under obligation to comply with any Prescription of the Gas Referees as to the provision of testing places and testing apparatus, and the Gas Examiners test the gas "subject to the Prescription of the Gas Referees."

The tests by which the calorific value of the gas supplied to consumers is ascertained are, therefore, made in accordance with the prescriptions or instructions of the Gas Referees, to whom the gas undertakers must furnish any necessary information. Notwithstanding the great importance to the nine million gas consumers in Great Britain of the duties and responsibilities of the Gas Referees, the man-in-the-street knows little or nothing about them. A few words may, therefore, be said as to their history.

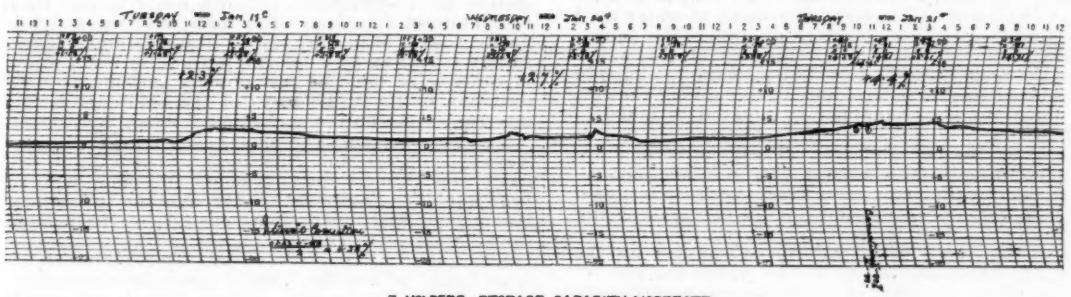
Gas Referees were first appointed under the provisions of Acts passed in 1868 and 1869 relating to gas companies then operating in London. The Referees continued to act in regard to the three Metropolitan Gas Companies until 1920, in which year the Gas Regulation Act extended their duties to all statutory gas undertakings in the United Kingdom. In 1922 their powers and duties in regard to Ireland ceased, owing to the changes brought about by the Government of Ireland Act. The early Gas Referees were concerned chiefly with photometry, and it was in this connection that one of them—Dr. A. Vernon Harcourt—devised the 10-candle standard lamp from which the present International Standard of Light is descended. In 1905 they were called upon to prescribe methods of gas calorimetry, as supplementary and subsidiary to the official testings of illuminating power. The latter testings continued, though gradually fading in importance, until 1920, after which year calorimetry entirely displaced photometry in official testings of the quality of the gas supplied in Great Britain.

The duties of the Gas Referees were relatively light prior to 1921, because they were limited to the three Metropolitan Gas Companies, which however were responsible for more than one-fifth of the gas sold throughout Great

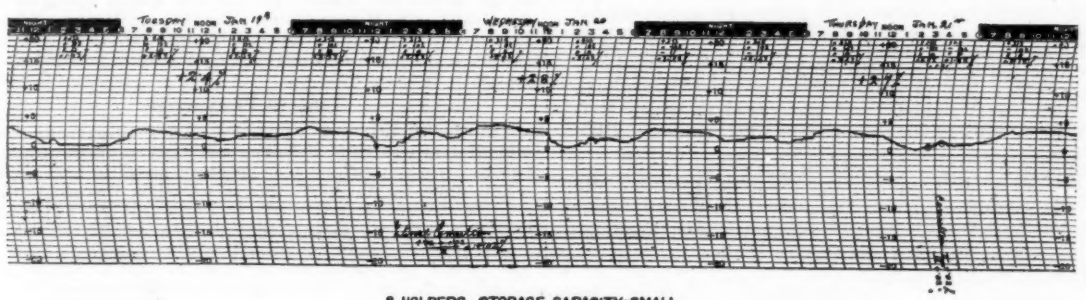
THREE HOLDER STATIONS SUPPLYING COKE-OVEN GAS ONLY TO SAME GENERAL DISTRIBUTING SYSTEM.
JANUARY 1932.



5 HOLDERS. STORAGE CAPACITY-AMPLE.
A.



3 HOLDERS. STORAGE CAPACITY-MODERATE.
B.



2 HOLDERS. STORAGE CAPACITY-SMALL.
C.

FIG. 6.

Britain. The Referees have always been appointed by the Board of Trade, but at no time have they been Civil Servants, or precluded from other duties or pursuits. Their names for the past 60 years are given in Table IV.

Referees since the Gas Regulation Act came into force are shown for each year in Table V. This shows also the numbers of thermometers discarded through breakage or otherwise, but does not show the numbers of apparatus rejected

TABLE IV.—*Gas Referees*, 1872-1932.

Years.	Area.	Referees.		
1872–1891 . . .	London	John Tyndall, LL.D., F.R.S.	Wm. Pole, Mus.Doc., M.Inst.C.E., F.R.S.	A. Vernon Harcourt, D.Sc., F.R.S.
1892–1896 . . .	Do.	(Sir) Arthur W. Rucker, D.Sc., F.R.S.	Do.	Do.
1897–1899 (Aug.) .	Do.	C. Vernon Boys, A.R.S.M., F.R.S.	Do.	Do.
1899 (Sept.)–1917 (Sept.) . . .	Do.	Do.	J. S. Haldane, C.H., D.Sc., F.R.S.	Do.
1917 (Oct.)–1920 .	Do.	Do.	Do.	W. J. A. Butterfield, M.A., F.I.C.
1921	United Kingdom	Do.	Do.	Do.
1922– . . .	Great Britain	Do.	Do.	Do.

The remuneration and expenses of the Gas Referees have at all times been recoverable from the gas undertakings which come under their prescriptions, and have never been a charge on the taxes or rates. From 1921 onwards they have been drawn from a fund to which the undertakings may be called upon to contribute not more than 3s. for every million c.ft. of gas sold by them. The rate of contribution to the Gas Fund, out of which also certain gas administration expenses of the Board of Trade are met, has been for the past two or three years only one-third of the permissible maximum. The expenses of the Gas Referees cover the examination of the apparatus which they certify for use in official testings, for which examination no fees are charged.

Calorimetric Apparatus.

The calorimetry of gas necessarily involves accurate measurements of volumes of gas and of differences of temperature, as well as of the weight or volume of water used in the testings. The thermometers on which the fundamental observations depend are compared at every five degrees of the scale, from 5° to 45° C. with the readings of special standard thermometers, and a table giving the corrections which the Gas Examiner is required to make to the thermometer readings at any part of the scale is supplied to him by the Gas Referees. These corrections are ordinarily accurate to the nearest 0·02° C., and are re-ascertained by the Referees after three years, and again after seven years, in order to allow for the effects of ageing of the glass. For minor temperature observations smaller thermometers are used which are also examined by the Referees. The experimental meters by which the rate of consumption of the gas used in the testings is ascertained, are of three varying types, which involve the use of two different methods of verification. In the older type, a standard meter-proving measure is used, and this is examined by the Referees before it is passed for use in official testing places. The other two types are directly examined by the Referees, and a setting gauge for the water-levelling point is adjusted and sealed by them. In the majority of cases, the water used in a testing is measured (though in certain instances weighed), and the vessel in which it is collected for measurement is examined and certified by the Referees.

The numbers of these essential items of the testing apparatus which have been examined and certified by the for inaccuracy or structural defects, which at one time represented a considerable proportion of the whole submitted for examination. In addition to the apparatus set forth in Table V., which provides the standards of measurement, the gas calorimeter comprises also the instrument in which these standards are applied. This is usually designed for control and observation by the Gas Examiner throughout the period covered by his testing, but it may be designed to continue in action unattended for several days, and to furnish a record of its automatic examination of the gas. Either type of calorimeter needs proper design and careful construction, and each such instrument is examined and approved by the Gas Referees before it comes into use for official testings. Such examination is especially protracted in the case of continuously recording calorimeters, in the design and construction of which very many difficult problems have to be solved. For instance, one widely used type of recording gas calorimeter—the Fairweather—requires water to flow through it at a uniform rate hour after hour, and the water is ordinarily taken from the town's water mains. This water supply is satisfactory for the purpose in many towns, but in others, for more or less obscure reasons, it causes obstruction of the water-ways of the calorimeter, and thus interrupts its continuous action. When this is found to occur, arrangements are made, as is normally done in the Boys type of recording calorimeter, to cool the water which has passed through the instrument and pump it to an overhead tank for re-circulation through the instrument. By this means, the obstructions caused by fresh supplies of town's water are avoided.

Recording calorimeters of the Fairweather type have been found to use the town's water satisfactorily in the area of the Metropolitan Water Board, and in Bolton, Bournemouth, Bradford, Cardiff, Edinburgh, Leeds, Manchester, Newcastle, and Southampton, while re-circulation of the water (or water from private wells) has been found necessary at Birmingham, Brighton, Derby, Glasgow, Liverpool, Plymouth, and Sheffield. Obviously it is not simply a question of the relative degree of hardness of the water.

Testing Provisions.

The certification or approval of the apparatus used in official testings thus involves not only a large amount of routine work in which the greatest possible care and precision must be observed, but also, when inconsistencies in

TABLE V.—*Testing Apparatus Certified by the Gas Referees.*

Year.	Long Thermometers.			Short Thermometers.			Water Measuring Cylinders Certified.	Meter Proving Measures Certified.	Calibrated Meters (with Gauge Certified.)	
	First Certification.	Re-Certification After Three Years.	Discarded Since Year of First Certification.	First Certification.	Re-Certification After Seven Years.	Discarded Since Year of First Certification.			Boys Bell.	Hyde Modified.
1921	205	..	87	261	..	136	111	35	..	..
1922	971	..	353	1112	..	475	376	354	..	..
1923	640	..	135	721	..	475	240	213	..	..
1924	691	15	194	643	2†	341	222	115	7	..
1925	680	337	312	349	40†	83	133	48	18	..
1926	598	511	370	203	15†	54	138	34	13	..
1927	638	385	302	297	..	72	119	52	22	..
1928	526	341	287	400	..	128	155	61	44	..
1929	590	315	205	680	190	101	206	83	22	53
1930	832	411	188	1119	313	210	238	74	32	159
1931	523	304*	94	1049	432	130	127	27	30	85
Totals 1921–31	6894	2619	2527	6834	992	2205	2065	1096	188‡	297§

* 5 also re-certified a second time. † Re-certified before seven years had elapsed. ‡ 53 also subsequently re-certified. § 8 also subsequently re-certified.

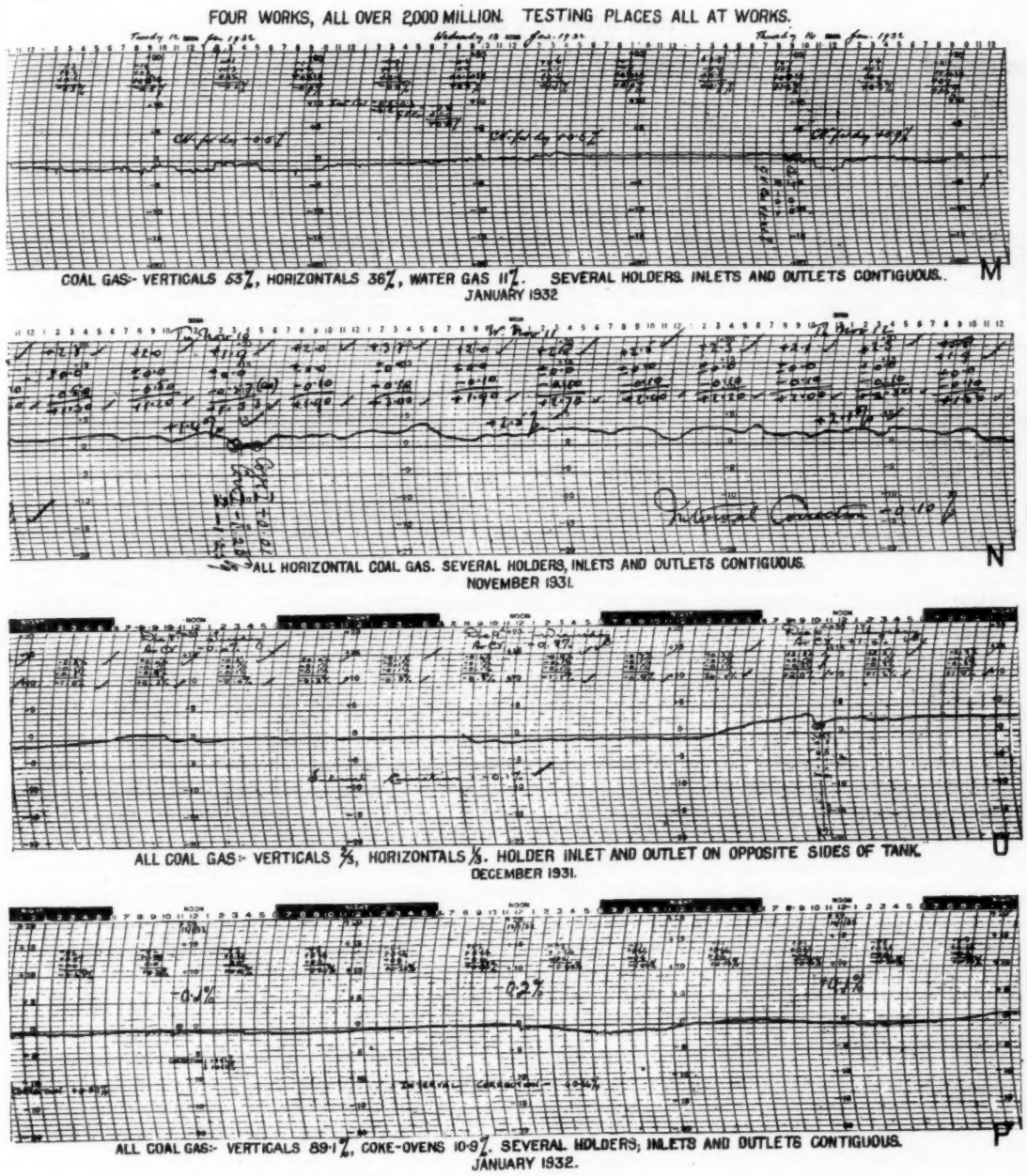

FOUR WORKS, ALL OVER 2,000 MILLION. TESTING PLACES ALL AT WORKS.
COAL GAS:- VERTICALS 53%, HORIZONTALS 36%, WATER GAS 11%. SEVERAL HOLDERS. INLETS AND OUTLETS CONTIGUOUS.
JANUARY 1932
M
ALL HORIZONTAL COAL GAS. SEVERAL HOLDERS, INLETS AND OUTLETS CONTIGUOUS.
NOVEMBER 1931.
N
ALL COAL GAS:- VERTICALS ⅔, HORIZONTALS ⅓. HOLDER INLET AND OUTLET ON OPPOSITE SIDES OF TANK.
DECEMBER 1931.
O
ALL COAL GAS:- VERTICALS 89·1%, COKE-OVENS 10·9%. SEVERAL HOLDERS, INLETS AND OUTLETS CONTIGUOUS.
JANUARY 1932.
P

FIG. 7.

behaviour are observed, the study of the causes thereof. Further, not only the testing apparatus but the testing places themselves are required to be provided and maintained to the satisfaction of the Gas Referees, who have also to prescribe the times of the testings, the manner in which they shall be made by the Gas Examiners, and the manner in which the average calorific value for the quarter shall be ascertained, as well as the means by which the results of the tests shall be made available to the public.

It is clear that the provisions of the Gas Undertakings Acts, 1920 and 1929, give facilities for the protection of the interests of the consumer of gas in Great Britain, which leave little to be desired. Provided the consumers do their part in ensuring that Gas Examiners are appointed, there is ample justification for the statement which Prof. C. V. Boys has made in a Preface which he has contributed to a forthcoming book on Gas Calorimetry—viz.:

> The fact is that no single commodity generally purchased by the public is so carefully watched and maintained of its guaranteed quality as gas, and it is a fairly safe thing to say that gas and water, about the cost of which complaints are so often made, are the two things ordinarily bought which are best worth while.

Results of Advances in Works Practice.

It remains to indicate the improvement in uniformity of calorific value which has taken place in a large proportion of the gas supplies during the past ten years. No one will question that such improvement is due to the natural development of works processes and administration, but there can likewise be little doubt that it has also been stimulated by the statutory obligations and the testing provisions which the Gas Regulation Act created.

The Smaller Works.

The first complete year for which official reports of testings of any considerable number of gas undertakings are available is 1923, and it is instructive to compare the results of testings made in that year with those for the same undertaking or works in 1931. A summary of the comparative figures for 75 of these works is given in Table VI. The works included in these comparisons have not been selected in any way; they are all those coming within the scales of operation mentioned in the first column for which strictly comparable figures for the two years are available. A number of works have been omitted, because in one or other of the two years the declared value has been changed, or transfer has been made in the interval from manufacture to purchase in bulk.

It will be seen that the smaller undertakings as a whole work with a greater margin above their declared calorific values than the larger ones find necessary. This margin, however, has been substantially reduced between 1923 and 1931. It is moreover still lower with most works whose sales exceed 1000 millions. The surplus must necessarily be greater when the calorific value of the supply fluctuates

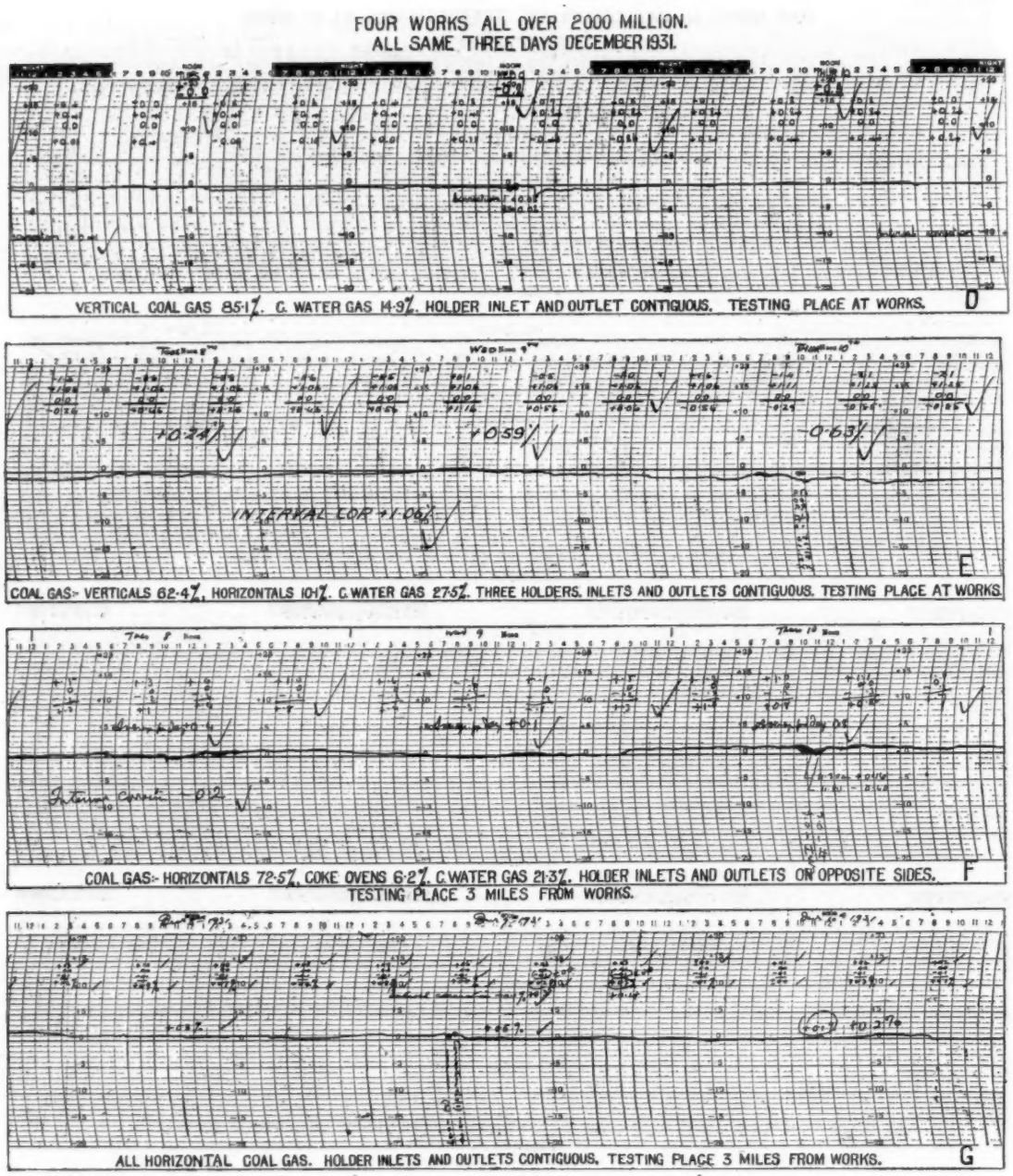

FOUR WORKS ALL OVER 2000 MILLION.
ALL SAME THREE DAYS DECEMBER 1931.
VERTICAL COAL GAS 85·1%. C. WATER GAS 14·9%. HOLDER INLET AND OUTLET CONTIGUOUS. TESTING PLACE AT WORKS. D
+0·24%
+0·59%
-0·63%
INTERVAL FOR +1·06%
COAL GAS:- VERTICALS 62·4%, HORIZONTALS 10·1%. C.WATER GAS 27·5%. THREE HOLDERS. INLETS AND OUTLETS CONTIGUOUS. TESTING PLACE AT WORKS. E
COAL GAS:- HORIZONTALS 72·5%, COKE OVENS 6·2%, C.WATER GAS 21·3%. HOLDER INLETS AND OUTLETS ON OPPOSITE SIDES. TESTING PLACE 3 MILES FROM WORKS. F
ALL HORIZONTAL COAL GAS. HOLDER INLETS AND OUTLETS CONTIGUOUS. TESTING PLACE 3 MILES FROM WORKS. G

FIG. 8.

widely, because the management cannot risk any of these fluctuations bringing the gas as much as 6 p.ct. below the declared value for a period of two hours or upwards, because, if such a deficiency is shown in the Gas Examiner's report, the gas undertakers become liable to incur a forfeiture, notwithstanding compensatory fluctuations in the opposite sense.

The fluctuations are greater with some types of works plant than with others, notwithstanding careful supervision of its working. The fluctuations are, disregarding isolated cases, becoming less as plant and supervision are improved. This is clearly indicated by the differences shown between 1923 and 1931 in the last two columns of Table VI. One striking feature of this Table is how well the smaller works compare, on the whole, with those in the 100-250 million category.

The relative differences in the fluctuations of calorific value from hour to hour and day to day in the gas supplied by different works may be appreciated by reference to fig. 1, which is a reproduction of the official charts for Monday, Tuesday, and Wednesday of " Sigma " B.Th.U. recorders at testing places for four different undertakings, one in Scotland, two in different parts of the Midlands, and one in the South of England. The portions of charts reproduced are typical of those for these works, and consequently are strictly comparable for the difference in the uniformity of the gas as generally supplied by them.

TABLE VI.—*Comparison of Fluctuations of Calorific Value in 1923 and 1931.*

From the Results of Official Testings for same Works.

Scale of Operations of Works. Sales of Gas in 1930	Number of Works Included.	Mean Percentage Deviation from Declared Value of Average for the Year.		Mean Difference Between Maximum and Minimum Calorific Values in the Year. Percentage of Declared Value.	
Millions of C.Ft.	—	1923.	1931.	1923.	1931.
20–100	29	+ 4·37	+ 2·55	9·66	7·01
100–250	24	+ 4·29	+ 2·48	11·97	7·52
250–1000	22	+ 2·82	+ 1·44	9·55	6·72

Brief particulars are given of the works plant in each case. It is obvious that the works which furnished chart " T " cannot with its present plant work so closely to its declared value as any one of the other three works, and, from this standpoint, it is less efficient. On the other hand, even the fluctuations shown in that chart would not lead to trouble with gas engines, and should not deter a user of gas for power purposes from placing his factory in the district served by this works. If these charts are compared with those from water-flow calorimeters, it must

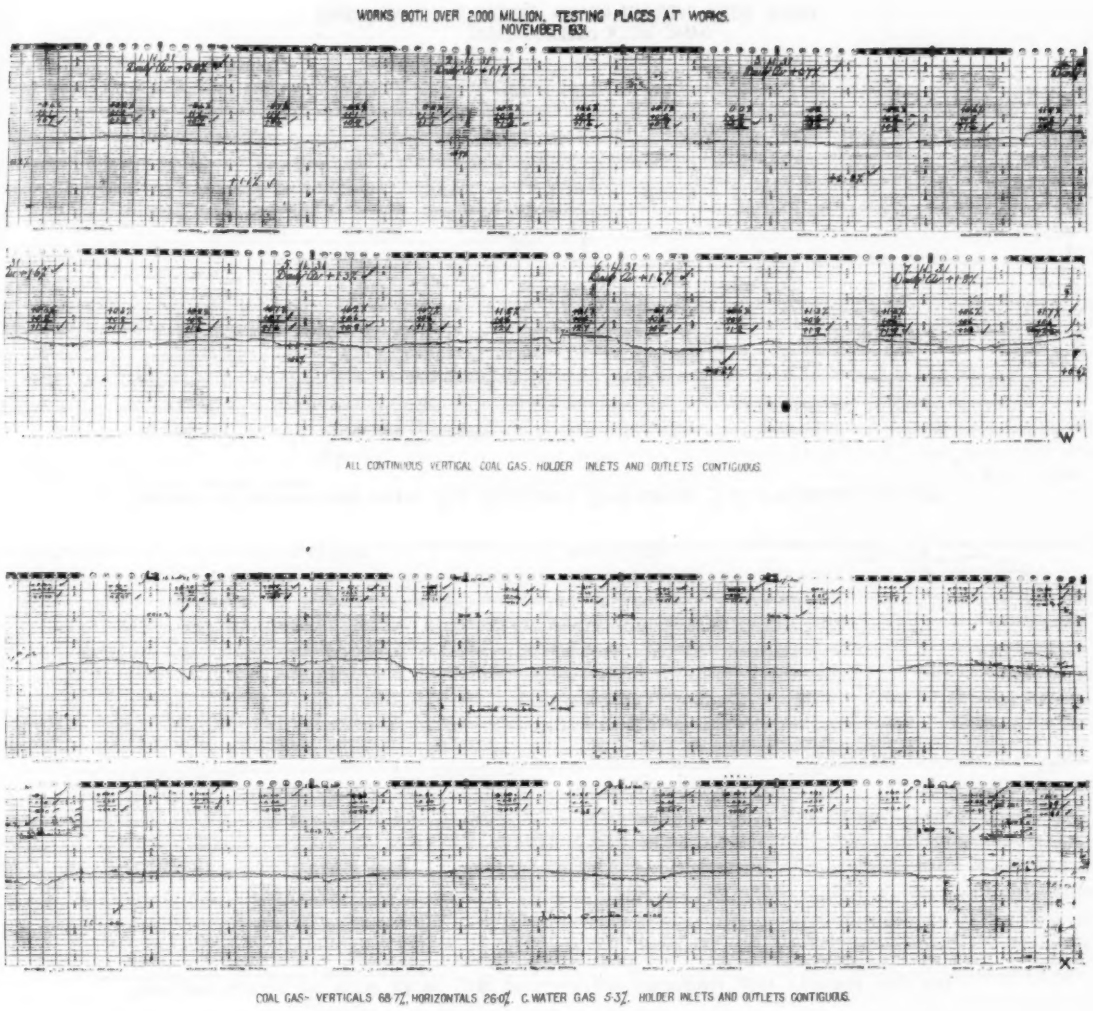

WORKS BOTH OVER 2,000 MILLION. TESTING PLACES AT WORKS.
NOVEMBER 6/31
ALL CONTINUOUS VERTICAL COAL GAS. HOLDER INLETS AND OUTLETS CONTIGUOUS.
COAL GAS- VERTICALS 68·7%, HORIZONTALS 26·0%. C.WATER GAS 5·3%. HOLDER INLETS AND OUTLETS CONTIGUOUS.

FIG. 9

be borne in mind that the "Sigma" instrument is inferential, and that fluctuations are, owing to its quicker response to changes, apparently greater in magnitude than those shown by water-flow instruments on the same supply.

The Larger Works.

Passing on to larger works, the testing places for which are provided with recording calorimeters, a great deal of information is available as to the uniformity in calorific value of the gas supplied. There is no doubt that the fluctuations are, generally speaking, less than a few years ago. A marked improvement is commonly observable within twelve months of the approval of a recording calorimeter for official testings. It may be a mere coincidence that the improvement happens at this period, and it may be that changes in works plant would have brought it about in any case. The fact is, however, well illustrated by the curves in fig. 2, which gives charts for the same works in the corresponding weeks of 1930 and 1931, the recording calorimeter having come into official use rather earlier in 1930. The charts given in fig. 3 for another works for the corresponding weeks of 1928 and 1931 show that a very marked improvement in uniformity has been effected during the three years. In this period, however, increase in storage has greatly facilitated the mixing, and consequently the uniformity of the gas supplied.

On the other hand, a chart which was given in a paper read by the author before the Carbonization Conference in February, 1928 (fig. 4), being the record of an official calorimeter for a week in April, 1927, shows practically as uniform a curve of calorific value as that from the same testing place for the corresponding week of 1931 (fig. 5). In this case it would not be unreasonable to infer that some years' experience of official control by a recording calorimeter prior to 1927 had accustomed the staff to furnishing as uniform a curve as could be achieved from the plant at their disposal, and that naturally no further substantial improvement in this direction could be anticipated in the four subsequent years.

A feature of modern gas supply in some of the coal-mining districts is the displacement of gas-works manufacture by bulk supplies of gas from coke ovens. The charts shown in fig. 6 may be of interest in this connection. The gas undertaking concerned has ceased to make gas, for the time being at least, and its three nearly equal-sized works have become simply gasholder stations for delivering coke oven gas into a common distributing system. The supply to each holder station comes from different coke oven works. Two of the supplies appear more uniform than the third, but the difference may be attributed to the relatively small storage for the latter. All of them, however, compare very favourably in this respect with the product of many gas-works of similar output. While all the supplies are well above the declared value, one of them is much above the other two; but as the distributing system is connected in the district, it is, of course, impracticable to declare for the one supply a calorific value above that which the other two supplies can maintain continuously. The charts are typical—each week the chart for one of the three holder stations shows a curve about 7 p.ct. above the declared value of the undertaking.

Reverting to manufacturing stations, fig. 7 is a reproduction of four recent charts for Wednesday, Thursday, and Friday from official testing places for large works, where different manufacturing and storage conditions prevail. The curves are typical as regards fluctuations, but it does not of course follow that other weeks show similar mean values for the gas supplied from these works. Like most of the larger works, all these four have an average at the end of each quarter which is very rarely as much as 1 p.ct. above the declared value.

Fig. 8 reproduces charts for the Wednesday, Thursday, and Friday of the same week in December last for four other large works. Two of the four charts are from test-

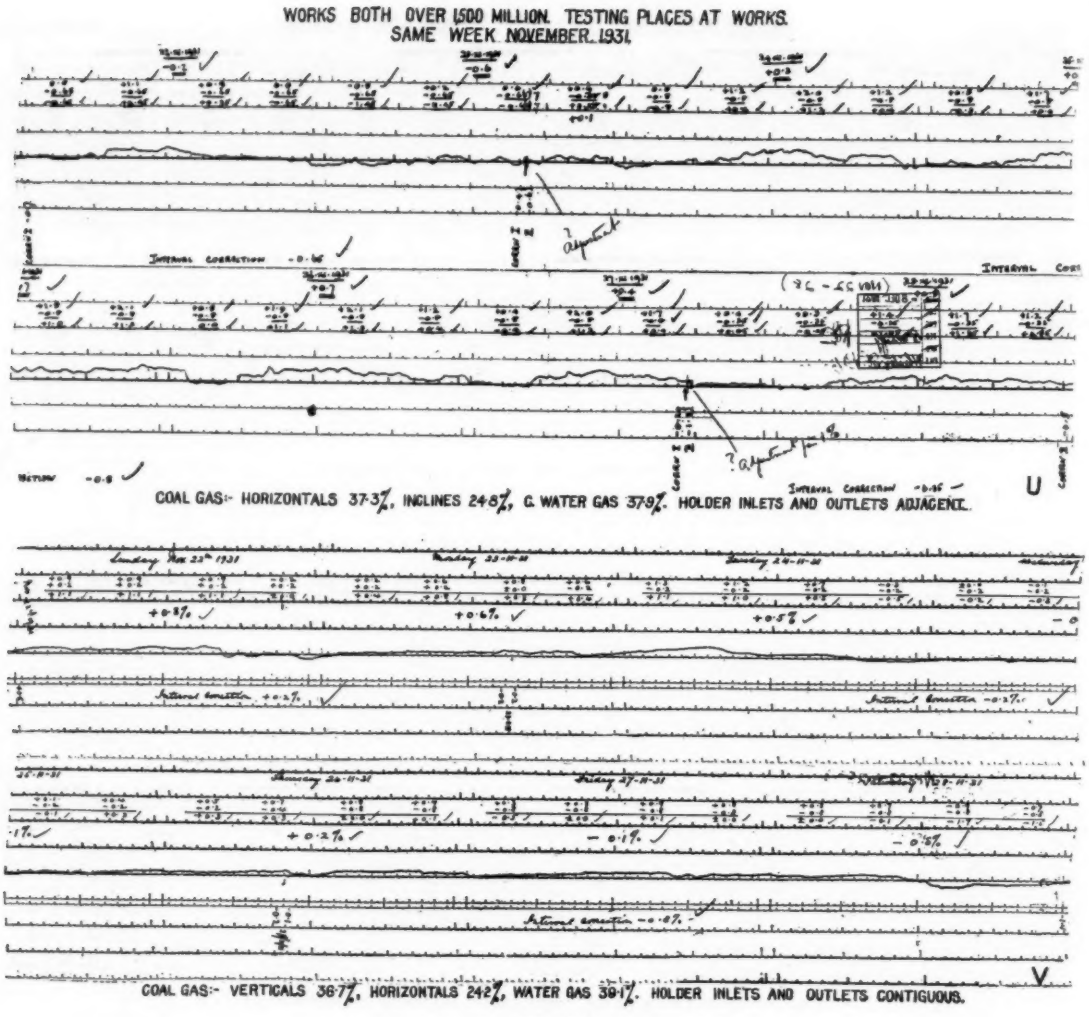

WORKS BOTH OVER 1500 MILLION. TESTING PLACES AT WORKS.
SAME WEEK NOVEMBER. 1931.
COAL GAS:- HORIZONTALS 37·3%, INCLINES 24·8%, C. WATER GAS 37·9%. HOLDER INLETS AND OUTLETS ADJACENT.
U
COAL GAS:- VERTICALS 36·7%, HORIZONTALS 24·2%, WATER GAS 39·1%. HOLDER INLETS AND OUTLETS CONTIGUOUS.
V

FIG. 10.

ing places situated about three miles from the works at which the gas is made, but on large trunk mains. These four charts show the remarkable uniformity of the gas supplied from large works, notwithstanding considerable divergence in the types of manufacturing plant and in the storage arrangements.

All the charts hitherto reproduced, except those in fig. 1, have been from Fairweather recording calorimeters. Fig. 9 gives charts for a week in November last from two official testing places each having a Thomas recording calorimeter. Both relate to the output of large works. Fig. 10 gives two charts, both for one week in November last, obtained by Boys recording calorimeters at official testing places for two somewhat smaller works. The curves of calorific value recorded are, of course, independent of the type of recorder, provided it is operating in conformity with the conditions laid down by the Gas Referees; but there are slight differences in the ruling of the charts, and on this account examples from each of the three types of recording calorimeter in official use are reproduced.

The Gas Consumers' Charter.

The gas consumer may, after reading what has been said about the testing provisions of the Gas Undertakings Acts, 1920 and 1929, still be uncertain as to how he is directly concerned in them. There is no doubt that gas consumers as a body have benefited through the strict observance by the undertakers of statutory requirements under these Acts in all districts for which official Gas Examiners have been appointed. The standard of performance and service has been raised in the Gas Industry in the past ten years; to what extent this improvement is due to the control exercised by official testings is obviously indeterminable. There is no question, however. that the sale of gas by the therm has conduced to a supply being given which meets the consumers' needs better than the supplies given in most districts in earlier periods. If any consumer now finds his gas supply unsatisfactory, he should in the first instance appeal to the gas company or gas department which serves him. They are under obligation to produce to him a copy of the Gas Examiner's report for the preceding quarter, and if this shows that the statutory requirements as to calorific value have been fulfilled, the consumer may rest assured (in the absence of a temporary lapse which would be recorded in the next quarterly report) that his dissatisfaction is due to some other cause, such as faulty service pipes, fittings or appliances, or possibly inadequate pressure.

While pressure is, strictly speaking, outside the scope of this address, it may be pointed out that the Quarterly Report will show whether the minimum permissible pressure has been ordinarily maintained. There may, however, be some purely local deficiency of pressure, of which the gas suppliers may not be aware, until they receive the consumer's complaint. They will advise and help him if his dissatisfaction is due to a cause under his own control; if his trouble is caused by local or temporary deficiency of pressure they have the impelling force of reduction in sales ensuing therefrom to lead them to overcome it as quickly as possible. Should, however, his trouble be due to low pressure and his complaint to the suppliers be of no avail, he and the other consumers directly affected, can claim to have local testings of pressure made by the official Gas Examiner for the district, on whose report proceedings against the suppliers can be undertaken in the event of the pressure having been found to be less than the minimum permissible. The Gas Regulation Act, 1920, gives gas consumers not merely the right to an efficient service, but also the means of enforcing that right, and in this respect it may appropriately be regarded as the "Gas Consumers' Charter."

This address has been prepared by desire of the Committee of the Joint Gas Conference, with the concurrence of the author's official colleagues, in the hope that the information given, some of which only the Gas Referees could readily furnish, will be of service both to the Gas Industry and the Gas Consumer.

THE "JOURNAL" TECHNICAL RECORD

Which contains Reports of Meetings of Gas and Allied Associations

Distribution at High and Medium Pressures in the Area of Supply of the Gas Light and Coke Company

Discussion on Paper* by Mr. H. J. Escreet, B.Sc., Assoc.M.Inst.C.E., Assistant Distributing Engineer to the Gas Light and Coke Company, before the London and Southern District Junior Gas Association on Friday, Feb. 19, 1932

The PRESIDENT (Mr. J. H. Goldsmith, South Suburban Gas Company), after thanking Mr. Escreet for his very interesting paper, remarked that there were one or two points he would like to raise. The first was in connection with the Widlake recorder; Mr. Escreet had not mentioned the Widlake control at all. Such a system lent itself to automatic control, and he wondered if any of the governors were automatically controlled in this way. Continuing, Mr. Goldsmith recalled the fact that Kent automatic governors had been exhibited at the British Industries Fair last year, and they had been rather amazed at their complicated mechanism; so that they could well understand that there might be a number of parts liable to go wrong. He referred particularly to the possibility of the water in the governors freezing in outlying districts. He inquired whether the Kent governor was controlled by an electrical clock, and also asked for further details of the function of the vent in the bottom of the ventilator column which had been described.

Mr. ESCREET explained the function of this vent, whereby the hot air rose up the column, and the cool air was drawn in. In further reply to Mr. Goldsmith, he said that they had not used the Widlake distance control; he had referred to these as "recorders" in the paper, whereas, as a matter of fact, they were Widlake "indicators." To prevent the possibility of the water freezing in the Kent governors, they put in a solution of glycerin. They had tried paraffin oils for the same purpose, but this seemed to leak out. The governors were clock controlled in the ordinary way—not electrically.

Mr. P. RICHBELL (Croydon) said that he had listened to the paper with the greatest interest, and the various systems described needed a lot of thought. The system as a whole was so large as to make it difficult to discuss it adequately there. A point he noticed was that in the early days the Beckton system was worked at the ordinary district pressures, whereas at the present time it had gradually been built up to a pressure of 78 in. W.G. And in this connection he wondered if any trouble had been experienced with the joints on the line, and, if so, what steps had been taken to remedy it. Referring to the Richmond high-pressure system, there were three branches going out from the Richmond works, and he inquired what type of governors had been fixed at the respective points. In conclusion, he thanked Mr. Escreet for the very valuable information he had given them.

LEAKAGE TROUBLE.

Mr. ESCREET, in reply, stated that they had a good deal of trouble from leakage on the Beckton system up till about eight years ago, particularly in the Commercial Road between Canning Town and Aldgate. This was in the area of the Commercial Gas Company. The main was laid on marshy ground with very heavy traffic to and from the Docks, and the leakage might have been due to the additional pressure or to the age of the mains which had been laid fifty years before. They had surmounted the trouble, however, by cutting out the joints and re-running and re-caulking them. The governors on the Richmond system were Peebles mercurial governors.

Mr. S. H. MILES (Reading) congratulated Mr. Escreet on his splendid paper. A post such as his could not spare him much time for the preparation of papers. In connection with the Grays high-pressure system, he thought he was right in saying that Mr. A. W. Sumner had not adopted dust traps; he had found that the dust was so fine that traps were of very little use. He inquired if this was still the case, and what was the practice of the Gas Light and Coke Company in this regard on other parts of their district. Were dust traps used at all on governors? A year or two ago Mr. Gill had referred to the fact that trench digging machines were being used in America. Were these used by the Gas Light and Coke Company? Mr. Miles thought that they would be of very little use in many districts on account of other pipes, cables, &c., in the ground. On the other hand, such machines might be useful on the long-distance country stretches in the Gas Light and Coke Company's area. He also asked if the Company had any definite policy in regard to duplicate mains under each footpath, or was each case decided on its merits?

Mr. ESCREET stated that they did not use dust traps at all on the Beckton system. In the Grays area they did not use any filter, but on some of the long lengths of main they fitted blow-off cocks near the inlets of the governors where the dust could be blown out, if it accumulated to any extent. They had used trench digging machines for the 24-in. main to Grays, which was laid on the verge of an arterial road where the machine could be used very comfortably. But he doubted whether the machine would be much use for the laying of small mains, and, as Mr. Miles had suggested, it would be dangerous in the inner areas on account of the proximity of other pipes and cables. The matter of duplicate mains was a difficult point; they decided every case on its merits. A number of matters had to be taken into consideration, such as the width of the road and the number of houses. In concrete roads it was best to keep the service pipes out of the carriageway if possible; but there was not a great deal in it if the services were properly protected. If at the end of 20 or 30 years it was necessary to renew all the services it would be cheaper to put a second main down then than in the first place. In the London districts where there was the expensive wood-block paving they were laying duplicate mains. Although he liked duplicate mains, Mr. Escreet found that it was extremely difficult to make out a case for them. It was often cheaper to put in a single main under one footway and long services, if this could be done before the concrete road surface was laid, but it was then necessary to find out from the builders where the houses were going to be put up.

PROTECTION OF PIPES UNDER CONCRETE.

Mr. F. T. BUIST (South Suburban Gas Company) inquired what Mr. Escreet recommended for protecting services under a concrete road. In the case of the 2-in. high-pressure main on the Grays system what sort of services were used—what size and how were they connected to the main? Regarding the underground governors, Mr. Escreet had told them that he experienced trouble due to the leakage of water into the pits. What had been done in the way of protecting the pits from this?

Mr. ESCREET remarked that the protection of services was a subject for a paper in itself. They had used wrapped pipe, pitch and troughing, and cement and troughing; it all depended upon the soil conditions. The services on the Grays area were of ¾-in. or 1-in. pipes, and if they were put in when the main was being laid they welded sockets to the main and screwed the cock into the socket. If the main was charged one could use expanded nipples or clips. The expanded nipple method was satisfactory, and they had special tackle for the work, with which they could carry out the whole job without any gas escaping. They had asphalted the outside of the underground governor pits in some cases in order to prevent water leaking in. Where they had already built the pit they tried various forms of water-proof cement, some of which were satisfactory, and if put on carefully made the pits reasonably watertight.

Mr. E. W. B. DUNNING (Gas Light and Coke Company), referring to Mr. Escreet's remarks regarding the corrosive soil in the Grays area, asked if he could give them any indication as to what this soil was.

Mr. ESCREET replied that, generally speaking, it was a clay soil. They had had various samples analyzed, but they had not got much further in the matter yet.

Mr. J. H. GREEN (Luton) inquired if any expansion joints were used, recalling that at one time the main at Grays was

* Mr. Escreet's paper is appearing in the "JOURNAL" in serial form. The first instalment was published in last week's issue, p. 484. Pressure on our space has made it necessary to postpone publication of the second instalment till next week.

pushed right out of the road. The usual packing for the mains was brick in the Grays area, and he wondered if the vibration had the effect of causing the brick to cut the wrapping of the pipes.

Mr. ESCREET said that in the laying of the 24-in. main to Grays, for which steel pipes with welded joints were used, they had inserted lead yarn joints at intervals, which allowed a little freedom. That main was charged up at the beginning of last year, and they had a few split joints during the first month or two. They put these right, and had up to the present had eleven months' working without trouble. He had heard about the main being pushed up at Grays, but they had experienced no trouble recently. They had put in valves at intervals of 1000 yards on the 8-in. steel main, and had used long sleeve lead wool joints for these. In one case they had trouble on several occasions with one of these joints leaking, so that finally they took it out and put in a concertina expansion joint. This had been in about a year and appeared to be satisfactory. In regard to the wrapping being cut, they tried to put fine soil round the pipe and keep stones away, though it was difficult to eliminate them entirely.

ELECTROLYSIS.

Mr. F. C. SMITH (Gas Light and Coke Company) remarked that they at Watson House had been co-operating in some of the work. When one was studying the question of electrolysis one read that the current left the main at a point of high resistance; and that this point would be a joint. A lot of measurements had been made, and they had found that these joints did not in fact have a high resistance. Mr. Escreet had had more opportunity of studying cases of electrolysis, and Mr. Smith would like his opinion as to whether it did occur particularly at joints.

Mr. ESCREET, in reply, said that while he knew that electrolysis did exist, he very seldom came across definite cases of it. They certainly had corrosion, and probably if the men were sufficiently expert they would be able to detect the difference between corrosion and electrolysis. Whether the few cases of electrolysis which had occurred were at the joints or not he could not say.

Mr. N. R. JUNKISON (Gas Light and Coke Company) asked if the Company used cement joints, as he understood that these were popular in America. If they had cement joints, bearing a high resistance to any stray electric current, it would be of great assistance in tracing the point where the current was entering the main.

Mr. ESCREET stated that they had not used pure cement joints on mains at all. When some of the 48-in. mains were laid they used to send a man up the pipe to fill up the backs of the joints with cement, and they had found that this practice made the main so rigid that it was difficult to cut it out when necessary. He did not think they wanted to give electric current the opportunity of jumping away at every joint, but the chief objection to cement joints was, he thought, that they made the main too rigid, with the result that the joint would not give under strain and the main would crack.

Mr. W. T. GEDGE (Tottenham) inquired if Mr. Escreet had had any experience with bitumastic compound and whether it was better than hessian wrapping. Also, what type of service governors were used and did they give any trouble?

Mr. ESCREET replied that he gathered the last speaker referred to the ¼-in. thick coating of bitumen. They had tried it last year, but there were several difficulties. Some consignments were very soft and picked up stones with which they came into contact, while other types were too hard and cracked when the pipes were handled. Bitumen run round the joints by using moulds should give a very good protection. The service governors were manufactured by Jeavons, and were of the ordinary diaphragm type, and had given very little serious trouble. Every service was fitted with a vent between the governor and the meter, which blew if the service governor broke down creating excessive pressure. Watson House had redesigned several points in these governors, and they should prove quite satisfactory in the future. On the whole, said Mr. Escreet, the consumer obtained better service from a high-pressure main with his own governor than from a low-pressure system.

POSITION OF SERVICE GOVERNORS.

Mr. J. A. RUDLING (South Suburban Gas Company) inquired if the service governors were in pits, and whether there was any flooding.

Mr. ESCREET replied that they were inside the house close to the wall, and the vent pipe was carried outside.

Mr. J. GRAMMER (Gas Light and Coke Company) asked if, in cases where the wrapping on mains became broken down and the pipe slightly corroded they had any experience of welding the hole instead of cutting out the whole section.

Mr. ESCREET said that usually, if they found the main was corroded, it was corroded over more than a small area, as once the wrapping had gone the moisture penetrated under the coating, so that it was better to cut the whole section out. On the other hand, if it was a small hole they might put in a nipple and plug. It was, however, quite possible to weld a patch on to a pipe.

In reply to a question as to whether the Gas Light and Coke Company were adopting a policy of small high-pressure mains, Mr. ESCREET said that it was a matter of development of the area. They would not go in for high pressures on the inner suburban areas, though they would be carrying on with the high-pressure system in the Grays district and some of the Pinner district. For rural areas it was the right thing, he considered, but he did not think they would adopt the American practice of pressures of 70 to 80 in. W.G. on their low-pressure system in urban areas.

Mr. C. D. STEPHENS (South Suburban Gas Company) asked if the high-pressure mains were cast iron, or were there any large steel mains? He also inquired if Mr. Escreet had had any experience of lead wool or of the lead wool and rubber joint; did he do any automatic caulking, and was this better than hand caulking?

Mr. ESCREET replied that practically the whole of the Beckton system was cast iron, the only steel mains being the extension to Staines and the main to Grays. They had only utilized the lead wool and rubber ring joint experimentally in one or two places in pipe subways, and these had been in use several years and seemed satisfactory. No mains had that type of joint exclusively. They only used pneumatic caulking for repairing joints by cutting out part of the joint and re-running. Recently they had dropped run lead and taken up lead yarn for the front joint. This work was done with pneumatic tools; but they were not utilized for actual main-laying. A number of small mains had been laid with lead wool, and he believed that the high-pressure lighting mains in the City and West End laid in 1910 were mostly laid with lead wool joints, and these had given no trouble at all.

CRANKLESS COMPRESSORS.

The PRESIDENT referred to the "Michell" crankless compressor mentioned in the course of the paper. Most of those present had had very little to do with these machines, and they would be interested in Mr. Escreet's views on these. A gas engine driving a turbo-booster through a concentric speed reducing gear had been mentioned; did this stand up to the impulse of the engine satisfactorily? He also inquired if they had to put a gland for the valve spindle to go through on the Peebles governors. Otherwise there might be a leakage back to the low-pressure side of the governor. The author had mentioned a maximum pressure drop of 3½ in. Was this usual practice so that no consumer got a variation of more than 3½ in.?

Mr. ESCREET stated that the "Michell" crankless compressor had only been running since last October, so that it was too soon to say whether it was as good as the ordinary reciprocating type or not. The reducing gear at Brentford had been satisfactory so far, but Mr. Birks would be able to say more about this. The pressure under the bell of the Peebles governors was quite all right provided the gland was a reasonable fit. If the gland became worn one had to put a diaphragm round it in order to prevent the gas getting back. The 3½-in. pressure drop referred to was a good standard in practice. He would like it to be reduced to 2 in. but this was not usually possible. If one was working 8 in. on the governors at peak load that gave 4½ in. at the other end of the trunk main, and there was a drop on the local mains and services in addition.

Mr. F. M. BIRKS (Gas Light and Coke Company) said that they would all realize the enormous amount of work entailed in the preparation of this paper. Probably many of them had not realized the enormous area of the districts, from one end to the other of which was almost a day's journey. In regard to the spring drive at Brentford, this was very satisfactory indeed, and the "Michell" crankless compressor also was giving no trouble, though it had run only a short time yet.

VOTE OF THANKS.

Mr. A. TENNANT (East Surrey Gas Company), Senior Vice-President, then rose to propose a hearty vote of thanks to Mr. Escreet for the very informative paper he had given them that evening. They had heard a great deal about the electrical grid; but on this occasion they had learnt something about the "gas grid north of the Thames." It reflected great credit on the forefathers of the Gas Light and Coke Company, who started the Beckton system, as far back as 1871, that the original scheme should have been carried out. He referred to the high-pressure system in his own Company's area, which, he said, consisted of 20 to 30 miles of small pipe, and which had given practically no trouble. Occasionally the governors did blow, but nevertheless he had no adverse criticism to offer in regard to the high-pressure system which was similar to that at Grays. He had great pleasure in moving a very hearty vote of thanks to Mr. Escreet for a paper which would be a valuable contribution to the Transactions of the Association.

Mr. R. N. LE FEVRE (Gas Light and Coke Company), in seconding the vote of thanks, remarked that he was sure they would welcome the paper, particularly as Mr. Escreet represented what they in the Gas Industry referred to as the "silent service." They read about new methods, but they were apt to forget the wonderful organization existing between the works and the utilization side, without which the whole thing could not continue. In regard to the 48-in. mains, they had calculated the amount of gas passing through in terms of energy, and they found that if the same quantity of heat were taken to London in the form of solid fuel, there would be an endless chain of coal carts going continuously throughout the twenty-four hours of the day. This said a great deal for those people who first laid those mains in 1870.

Mr. ESCREET, acknowledging the vote of thanks which had been carried by acclamation, thanked his listeners very much for the way in which the vote had been proposed. He hoped the paper had proved of interest. It was interesting to know, in regard to the 48-in. mains and the provisions made for the future, that if one took the actual demand and calculated the economic size of main for that demand, one would find that two 48-in. mains were needed—and they had got them.

The Industrial Gas Problem*

By Gordon H. F. Windiate, A.M.C.T., Technical Assistant, Stretford and District Gas Board

(*Continued from p. 492.*)

Lead Melting.

One firm is engaged in the manufacture of an article which is widely used throughout the world, and a certain process requires the use of lead. The lead is melted and run direct to the process at regular intervals, the pot being recharged immediately after each running with pig and re-melt lead.

Originally, gas was used in a furnace designed for coal firing at a price of 4·8d. per therm, but the furnace efficiency was so low that the cost of lead melting was said to be 5s. 3d. per ton. This was hopeless, and the manufacturers returned to solid fuel, and installed a modern oil-fired furnace for trial purposes. With fuel oil at 3·5d. per gallon melting costs were reduced to 2s. per ton.

Negotiations resulted in a specially designed gas-fired furnace being installed on trial. This was designed to give 600 lbs. of lead at a temperature of 750° C. every 15 to 20 minutes. Two velocity burners were provided, both being employed when starting up from cold, but one was found sufficient for normal working. They were situated on opposite sides of the furnace, and played tangentially into an annular flue surrounding the pot proper. The waste gases from the flue were run to the atmosphere, and no heat was recovered from that source. The arrangement was found to be satisfactory, as the results obtained indicate:

Test Period, June 4 to 17, 1929.

Total lead run	58·1 tons
,, pig lead charge	39·0 ,,
,, gas used	22,733 c.ft. = 114 therms
Gas charge	4·7d. per therm
Cost per ton of run lead	9·2d.
,, ,, ,, pig ,,	13·7d.
Gas used per ton of run lead	1·955 therms against the guarantee figure of 2·25 therms

When the pot was first suggested, doubt was expressed as to the possibility of the whole of the lead being of even temperature at the end of the 15 minutes' cycle; any unevenness of temperature would result in splitting of the lead in the next process. No such trouble arose, and the satisfaction given has resulted in three similar furnaces being installed, also two 3-ton pots.

The melting of non-ferrous metals in a crucible furnace is proving a more difficult problem. The factors effecting results so far have proved to be: (1) Size of the crucible; (2) Combustion space surrounding the crucible; (3) Maintenance of even temperature throughout metal; (4) Composition of metal.

At Stretford this problem has been carefully investigated with the assistance of Dr. Walter, of Birmingham, and the following results have been obtained. The furnaces consist of a "pit" to take a crucible, leaving an annular space between the crucible and the furnace lining, forming the combustion chamber. The first furnaces were fitted with one burner only, which fired tangentially into the combustion chamber, but it was found that in these circumstances gas could not compete with coke. The figures of the tests on these furnaces are indicated below:

Test Period, 10.15 a.m. to 4.15 p.m., July, 1930.

No. of furnaces	..	Two	..
No. of melts (150 lbs.)	..	Three per furnace	.. Six
Time for melts	..	First melts	.. 2¼ hours
		Subsequent melts	.. 1½ ,,
Metal treated	..	Gunmetal	.. 900 lbs.
Gas used	..		.. 8122 c.ft.

Allowing for a period from 12.30 to 1.15, the lunch period, during which the crucible was ready for pouring, a correction must be applied to the gas used figure, which now becomes 7522 c.ft., and gas used per 1 lb. of metal melted 8·35 c.ft.

To reduce this figure, a furnace having two burners was designed. As before, the burners played tangentially into the combustion chamber, inducing a swirling motion to the gases. The results were even higher than with the original furnace, 10·8 c.ft. per 1 lb. metal melted being the best figure obtained. Further alterations to this furnace were undertaken. The annular combustion chamber was reduced by increasing the thickness of the furnace lining, but no better figure than 9·07 c.ft. gas per 1 lb. metal melted was obtained.

Considering the quantity of metal, 150 lbs., to be too much, tests were carried out using only 70-lb. crucibles in a correspondingly smaller furnace with the following results:

No. of furnaces	..	One	..
No. of melts (70 lbs.)	..	Three	..
Time for melts	..	First melt	.. 62 mins.
		Subsequent melts	.. 58 ,,
Metal treated	..	Gunmetal	.. 210 lbs.
Gas used	..		1390 c.ft. = 6·64 c.ft. per lb.

It would appear that high temperatures, giving a high heat gradient, are required rather than a large amount of heat in the form of gaseous volume, which is rapidly lost to the atmosphere due to the very design of the furnace. Further developments would then appear to lie in the imitation of the efficient coke furnace, utilizing a "soaking" heat, by packing the combustion space with, say, carborundum chippings.

Furnaces of the reverbatory type would appear also to be very suitable, and available figures indicate that 3 c.ft. of gas per lb. of metal melted is easy to obtain.

The heating of steel billets prior to forging, &c., makes an interesting study for the industrial gas technician. The following figures give comparisons of two furnaces—one on oil and the other on gas—serving a drop stamp forging plant; the figures are taken over a 6-day working week:

	Gas.	Oil.
Consumption for heating up to working temperature	18,790 c.ft.	143 galls.
Consumption during working period	38,150 ,,	212 ,,
Total consumption	56,940 ,,	355 ,,
Total weight of steel treated	7,734 lbs.	7512 lbs.
Consumption per 1000 lbs. steel treated (total)	7,360 c.ft.	47·3 galls.
Consumption per 1000 lbs. steel treated (working period)	4,950 ,,	28·3 ,,

This fuel oil used was 70 secs. viscosity, 0·91 gravity, and cost £3 1s. 6d. per ton, and was equivalent to gas at 3·86d. per therm.

The gas furnace referred to has a hearth size of 3 ft. 6 in. by 3 ft. 3 in. by 9 in. high. Six burners are arranged three on either side, to play directly on the hearth; the refractories are Glenboig lining and magnesite flooring with 3-in. "Sil-o-Cel" insulation. The hearth gave considerable trouble at first, but the magnesite bricks now in use have proved exceptionally satisfactory.

It was found that, to obtain a good reducing atmosphere within the furnace, and maintain the high standard of forgings free from scale expected from a gas furnace, the burners had to be operated with excess gas; hence the poor efficiency resulting in a high gas consumption per 1000 lbs. of steel treated. It was suggested that burners introducing raw gas into the furnace from the back would give control of furnace atmosphere, thus allowing the main burners to be operated at full efficiency. This suggestion was acted upon, and three burners were introduced, with the following results taken over three working days:

Gas consumption (working period only)	18,164 c.ft.
Weight of steel treated	4,523 lbs.
Gas consumption per 1000 lbs. steel treated	4,016 c.ft.

This figure of 4016 c.ft. compares very favourably with that of 4950 c.ft. given above. The cost of these burners, including fixing, was less than £15. Their gas consumption was 180 c.ft. per hour of raw gas, but on admitting a little air, this was reduced to 90-100 c.ft. Besides enabling the gas consumption to be reduced, these burners tended to spread the heat more evenly over the hearth, and prevented conservation of heat at the furnace back. The quality of the forgings was greatly improved, resulting in reduced machining costs; and this, in conjunction with the ease of control, general cleanliness, and low cost, has persuaded the works manager of this particular firm to convert all oil furnaces to gas firing as each comes down for relining.

Discussion.

Mr. J. Graham (Lancaster) moved a vote of thanks to the author for his paper. He thought the figure of 13·7d. per ton of pig lead melting was very good. At Lancaster they had dealt with a case which had a large output, but used coke. They installed gas and brought the firm's figure to 1s. 10d. per ton, without using a special furnace. A good industrial

* From a paper before the Manchester Junior Gas Association.

load of 120,000 c.ft. per day was something worth holding down, and proved that a further study of gas being used for furnaces would well repay any undertaking.

Mr. A. GILSON seconded.

Mr. W. L. HEALD (Preston) said that his Company were making great efforts to increase their industrial load. At a certain motor works in the district they were making a certain unit, the cost with coal being 11s. 6d. per unit; other people were making the same unit at 7s. 9d. by oil, the finish, however, was not equal to the one produced by coal. It was said that if Preston would supply gas at 2s. 2d. per 1000 c.ft., they could produce a better finished article. Gas cost into the holder 2s. 3d., but they quoted 1s. 11d. It would take hundreds of gas cookers to make a good industrial load of 1½ millions, as with that additional consumption the cost of gas into the holders could be greatly reduced.

Mr. W. P. SMITH (Bolton) said he was pleased that the author stressed the need for increased research—on the part of users, the gas undertakings, and the makers of apparatus—on problems arising out of the use of gas for industrial purposes, for competition could only be successfully overcome by a sound knowledge of the scientific principles involved, and their effect on the problem in hand.

Mr. H. PLATT (Bolton) remarked that in many heating problems the fuel supply, the type of furnace, and the material under operation were very closely allied.

Mr. RESTALL (Burnley) stated that to level the load the electricity interests were prepared to supply at one-fifth of a penny per unit for current taken at off-peak periods. He felt that, to meet such competition, a uniform special charge per therm for industrial purposes in Lancashire would be useful.

Mr. WINDIATE said that in the mass production of motor parts gas could be very useful. Before Ford's left Stretford they used to take some 120 million c.ft. per annum. Each car produced cost 7s. 10d. for gas.

Wandsworth and District Gas Company

The Annual General Meeting was held at the Hotel Metropole, London, on Tuesday, Feb. 23—Mr. FRANK H. JONES (Chairman and Managing Director) presiding.

The SECRETARY read the notice convening the meeting, and the register of stockholders was sealed.

The minutes of the previous annual general meeting were taken as read.

The Chairman's Address.

The CHAIRMAN, in moving "that the report and statement of accounts for the year ended Dec. 31, 1931, be confirmed and adopted," said the accounts included a whole year's working of the old Wandsworth Company and a whole year's working of the Kingston Company, but only the last six months of the Sutton Gas Company. The accounts for the Sutton Company, however, only went to June 30 last year, so that the actual comparison of the figures with other years was not quite so simple as it generally had been. Before turning to the details of last year's history of the Company, he wanted to tell the stockholders how the results of a company appeal to some people. He had put the question to three persons of great experience, "How would you judge, very shortly, the quality of a gas company?" One said that the selling price of gas was the most important factor; another said he would look at the balance-sheet and see what assets there were compared with the liabilities of the company, while the third answer was the market value of the company's stock. He believed there was a lady present who was prepared to agree with that view, but he himself ventured to think that anyone of these views taken by itself was not quite the real test. He would combine the three tests and in that way a good general idea of what a company was would be obtained. If these tests were applied to the Wandsworth Gas Company—which he had done—it would be found that the Company's cheapest gas was 7·6d. per therm, and the average price received over the whole of the district from the Thames to Banstead, Ashtead, and Esher was 8¼d. per therm. These three districts were the farthest away from the works at Wandsworth.

The balance-sheet showed that the reserve fund, special purposes fund, and pension fund were represented very largely by British Government securities, and the Company owned a fleet of steamers capable of bringing all the coal required from the North to the Wandsworth Works. He would not be going too far in saying that the Company's position of having full carrying capacity for its coal requirements was unique.

The ordinary stock stood at about £114 for every £100 that morning. These three facts surely spoke for themselves, but he mentioned them as, knowing himself how they compared with other South of England gas companies, he was content to leave the stockholders to judge for themselves for he had no fear of their judgment. He read in the papers and heard at meetings references to the sale of the cheapest gas, and he personally did not boast on that matter because he did not think the Board would like it, and he did not think the stockholders would like it; but there were people present who knew which Company sold the cheapest gas in London, and he hoped they were quite satisfied with that Company. As a matter of fact, it was not quite fair to compare one company with another with regard to selling price, but actually the Wandsworth Company sold the cheapest gas in London during the year 1931.

INCREASED CALORIFIC VALUE.

During the year the Sutton Company had been amalgamated with the Wandsworth undertaking, and the calorific value of the gas in the Wandsworth area was raised from 470 B.Th.U. to 500 B.Th.U. An increase in the calorific value of the gas in Wandsworth had been talked about for some time and the opportunity of the amalgamation with the Sutton Company, which sold 500 B.Th.U. gas, was taken to bring the value in Wandsworth to the same figure.

During the year the Company had laid a large main partly 30 in. diameter and partly 24 in. diameter from the Wandsworth to the Kingston Gas-Works, and two new showrooms were opened, making a total of thirteen. In addition, a second battery of chamber ovens had been put to work at Wandsworth, and a footpath which went through the Mitcham Works and cut them in half, had been closed, very much to the convenience of working. The closing of this footpath had always been regarded as a very difficult thing to do, but owing very largely to the efforts of one of the Directors, Mr. Chart, this was done very much more easily than had been anticipated, and it was of very great value to the Company.

During the coming year it was hoped to complete a large gasholder at Worcester Park and also a main connecting it with the Wandsworth Works, and then it was hoped to send gas from Wandsworth to the whole of the district as required. He made no claim for the present Board nor for himself in regard to the site on which this holder was erected. The Chairman of the Company many years ago saw a piece of land which was not then even in the district of the Company, and when the Company had no idea of amalgamation with the Kingston or Sutton undertakings; but that gentleman believed such a scheme would come about some day, and he foresaw that this site at Worcester Park would be a key position for the distribution of gas over the whole of the district. That gentleman was very far-seeing, for to-day the Kingston and Sutton Companies had been amalgamated, and the site in question was right in the centre of the Company's area at the present time. An agreement had been made with the Southern Railway Company enabling the Company to lay a main from the new Worcester Park holder to the Epsom holder, and this would enable very great economies to be made in the manufacture and distribution of gas.

INCREASED SALES OF GAS.

From the report and balance-sheet it would be seen that the Company had increased its sales of gas during the year by over 4½ p.ct., but if the Sutton figures were taken into account, the figure would be nearer 5½ p.ct. This was a very good increase compared with many gas companies to-day. There had been added 7640 new consumers, which was about the same as in the previous year, and it would be appreciated that 15,000 new consumers in two years indicated that the task of the Directors and staff in dealing with such an increase was no light one. This meant the expenditure of capital on mains, and he could only hope that those who were responsible for the increase in consumers would be able to add another 7000 this year.

After the amalgamation with the Sutton undertaking the price of gas in Sutton was reduced from 9d. per therm to 8$\frac{3}{4}$d. per therm, as the Company was bound to do under the Order which was made by the Board of Trade.

During the summer the Company were able to raise on favourable terms £250,000 5 p.ct. preference stock and £60,000 5 p.ct. debenture stock. If they had waited until the calamity came last autumn, it would have been necessary to pay very much more dearly for that capital. The report recommended the payment of a dividend of 7 p.ct. for the year, which meant that under the basic price system of division of profits, £26,400 was paid as bonus to the co-partners.

Under a clause in the Company's Act of 1929 the Board was given the power to elect an additional Director who had certain qualifications, and a gentleman, whose name appeared on the balance-sheet, had been elected. In this connection he would mention only three facts. The gentleman in question was his son. That was neither a recommendation nor a bar, in his humble opinion. Mr. H. F. H. Jones had been unanimously elected, and not at his suggestion, to the Board of the Company. One of the chief reasons why he was anxious that a new Director should be appointed was that up to last year he was the youngest person in age on the Board of the Company, and it was the duty of the Board to look to the future as much as the present, and the Directors of to-morrow must be trained for that important position to-day. That was why the Board had made this election.

From the capital account it would be seen that the large net sum of £340,378 had been spent during the year. The Board was split up into Committees, and a great deal of money had been spent on land, buildings, mains, and meters. The largest item was mains, but the Board had not spent even the odd £78 in the sum of £340,378 without seeing, as far as they could,

that every £ of that money would earn its interest either immediately, or that there was a very good chance of it doing so shortly.

Much money had had to be spent in laying a main to Kingston Works and Worcester Park to connect up Wandsworth on the river, where the Company's ships arrived with their cargoes of coal, and where gas could be produced very much more cheaply than at any of the other works which were at Mitcham, Kingston, Sutton, and Epsom. It was necessary to face this large capital expenditure to make available the wonderful site the Company had on the river Thames in order that gas could be sold cheaply throughout the whole of the area. That was one of the chief reasons why it had been necessary to incur such a large capital expenditure during the past year.

He did not suggest, however, that all the Company's gas would be made at Wandsworth and less made at the other works in the future, but much more would be made at Wandsworth in the future because the Company had been built up on cheap gas, and it was impossible to sell cheap gas unless gas was made cheaply. Cheap gas was the only thing which would keep the Company going, and the moment this or any other gas company began to forget that, it would be going on the "down" line and not on the "up" line. He had said this before, but he would continue to do so as long as he had anything to do with a gas company, because some people did not attach enough importance to the part which the cheapness of gas played in the prosperity of a company such as this. Last week he had had the advantage of a discussion with the manager of one of the largest gas undertakings in the North of England, which bought much of its gas from the coke ovens very cheaply indeed, and he had stated that in London a great deal of business would be lost if the price of gas was not kept at the lowest possible figure. Indeed, this gentleman said they could not go on selling gas at the present price in London if the business was to be maintained.

There was little to be said about the revenue account. Proper provision had been made for depreciation and upkeep, and as Sutton had added to the reserve and special purposes funds the carry forward was larger. Some very valuable officers had been taken over from the Sutton undertaking, as had been done in the case of Kingston. These officers had been of the greatest value to the management of the Company.

Competition.

In the matter of competition, this was still very severe from electricity, and it had lately been found that there was very severe competition from cheap oil. He spoke with all seriousness on this matter, as this competition was very largely from cheap imported oil, which did not come from any part of the British Empire, and it was displacing gas and coke to a very large extent. The Company and its officials were very much alive to this, and every endeavour would be made to maintain the Company's position so far as gas and coke was concerned, because these were products from English coal, whereas a great deal of the oil that was used in competition did not come from British sources at all. The suggestion to "Buy British" was not always remembered by some people, and the amount of oil consumed in London and other large towns which was not of British origin was very menacing and very serious, and he could see the position arising that unless coal and all its products were protected, the Industry and the Nation would suffer.

At the last Annual Meeting, Mr. Croft, the Company's General Manager, was not present through illness, and that was the only time he had been absent from a meeting during his long connection with the Company. Fortunately, he was now back again and in good health. Certain other members of the staff had been unwell, and he would specially mention Mr. Sinclair, the Manager of the Kingston Works, who had had a serious operation, but was now, happily, making good progress.

Since the closing of the year, the Company had lost a loyal servant in Mr. Charles Gostelow, one of the leading foremen at the Wandsworth Works. No Company had ever been served by a better and more able man than Charles Gostelow, and his death was a very serious loss to the Company. Co-partnership during the year had been a real force in the working of the Company, and, before closing, the Chairman said he wished to pay a tribute on behalf of the Board to the manner in which the staff and employees had worked during the year, as they always did to keep the Company in the front rank of gas undertakings.

Mr. R. Garraway Rice (Deputy-Chairman) seconded the resolution for the adoption of the report and accounts.

Mr. Harold Palmer asked whether he was right in saying that the reserve fund was invested almost entirely outside the business in Trustee stocks.

The Chairman said he was glad this question had been raised, because it helped him to drive home a point. With the exception of part of the pension fund—which the Board thought should be invested in the Company—the reserve fund was invested almost entirely in outside investments of a Trustee character. The pension fund, it was thought, should have a substantial holding in the Company's stocks, but that was a personal matter to the employees.

The report and accounts were then adopted.

Dividends.

The Chairman moved the payment of a dividend at the rate of 5 p.ct. per annum for the six months ended Dec. 31, 1931, on the 5 p.ct. preference stock, and at the rate of 7 p.ct. per annum on the consolidated stock.

The Deputy-Chairman seconded the resolution, which was carried unanimously.

The Chairman pointed out in connection with this resolution that income-tax had been deducted at the rate of 5s. 6d. in the £ on the preference stock and 5s. in the £ on the consolidated stock. There was a reason for this if any shareholder desired an explanation. A deduction of only 5s. in the £ was permissible in the one case, and that had been done.

Re-Election of Directors and Auditor.

The Chairman proposed the re-election of Messrs. R. M. Chart, B. R. Green, and J. Bertram Brown as Directors of the Company.

Dr. T. A. I. Howell seconded, and the motion was carried unanimously.

Mr. J. C. Potter proposed, and Mr. O. B. Green seconded, the re-election of Mr. E. L. Burton as auditor, and the motion was carried unanimously.

Future Meetings at Wandsworth.

The Chairman said there were two other matters he wished to refer to. The first was that this would be the last meeting of the Company which would not be held in Wandsworth. He did not know what some of the stockholders thought on that matter, but there would be sufficient room now at the headquarters of the Company to hold the meetings there, and it was the definite intention of the Board to hold the meetings in future at the Company's headquarters. ["Hear, hear."] He was glad to hear that expression of approval.

Votes of Thanks.

The other matter was to propose a hearty vote of thanks to the staff and workmen of the Company. It was a very great pleasure to work with a small company, because it was then possible to know everybody. He had been connected with the management of some small companies, and it was an undoubted pleasure to go to the works and to know everybody by name and by sight. To-day, however, he was sorry to say the Wandsworth Company had grown to such proportions that this was quite impossible. It was only possible for the Chairman to do what he could to know the workpeople and staff, and as he was in a position to judge whether the work was being done efficiently or not he was able to say that the work was done most efficiently. Therefore, he asked the shareholders to pass a hearty vote of thanks to the staff and workpeople for the hard work they had put in during the past year, for the intelligence they had shown, and for the very good spirit manifested towards the Company which he believed could be claimed to be very largely due to co-partnership. If the shareholders would look at the revenue account and notice the amount of the co-partnership and pensions funds, which had nothing to do with the National Insurance Fund, it would be seen that the Company was really entitled to expect good results. Certainly it was getting them, and he asked for a cordial vote of thanks to Mr. Croft, Mr. Cromarty, Mr. Bates, and all the staff and workpeople of the Company.

Mr. Harold Palmer, in seconding, said a glance at the figures in the accounts was sufficient indication of the efficiency with which the work of the Company was being carried on. For instance, leakage was under 5 p.ct., which showed the workpeople were watching things and doing their utmost to maintain a good supply of gas.

The Chairman said he was particularly pleased that Mr. Palmer should have seconded this vote of thanks. He was not aware that Mr. Palmer was coming to the meeting and that he would second the resolution, but it was gratifying that he should have done so, because, being a Director of one of the largest foreign gas companies in the world, and a colleague of his on the Board of another company, he was in a position to know whether the work was being carried on efficiently.

The vote of thanks was carried with acclamation.

Mr. C. M. Croft (Engineer and General Manager), acknowledging the vote of thanks, said the meeting was really only thanking the staff and workmen for doing their duty, and he might say they were not likely to be able to do otherwise with such a Chairman as Mr. Frank Jones, who took the best points out of the balance-sheets of other companies with which he was connected, and wanted to know why the Wandsworth staff could not do better. They were all constantly trying to do better, and while they were well equipped they recognized they had competition to face, but it was a material help to have such a Chairman. Mr. Croft said he would see that the vote of thanks was transmitted to all the staff and workmen.

Mr. W. H. Cromarty (Secretary) added his appreciation to that of Mr. Croft for the vote of thanks.

Mr. L. Bates (Comptroller and Accountant) assured the shareholders that everybody in the Company tried to take an interest in their work and do their best. Indeed, they could hardly fail to do so in view of the manner in which they were supported by the Board.

Mr. Samuel Brown proposed a vote of thanks to the Chairman and Directors for the manner in which they had carried on the business of the Company during the past year. It was a great satisfaction, when dividends were falling as they had been, to see the business of the Company maintained.

Mr. O. B. Green, in seconding the vote of thanks, said it was a great satisfaction to know that there was yet another Mr. Jones to maintain the great tradition of the family in the Company. It would be difficult to contemplate the Wandsworth Company without a Mr. Jones.

The vote of thanks was passed with acclamation.

The Chairman acknowledged the vote of thanks, and the meeting closed.

Tottenham and District Gas Company

ANNUAL MEETING

The Annual General Meeting of the Tottenham and District Gas Company was held on Tuesday, Feb. 23, at Woodall House, Lordship Lane, Wood Green, N. 22—Mr. HENRY WOODALL, M.Inst.C.E. (the Chairman of Directors), presiding.

The CHAIRMAN called upon the Secretary to read the notice convening the Meeting.

The SECRETARY (Mr. Edward J. K. Fussell, F.C.I.S.) read the notice, and thereafter the common seal was affixed to the register of proprietors.

The Chairman's Address.

The CHAIRMAN said: It is usual to ask you to take the Directors' report, the auditors' report, and the accounts as read. [Agreed.]

This is the first Annual Meeting we have held in these our new offices, and the tenth over which I have had the honour to preside, and it is with no little satisfaction that I am able to put before you perhaps the most favourable of the many satisfactory reports of the last ten years.

Last year we were able to reduce the price of gas, and in consequence to increase our dividend. The reduction in price of 1d. per 1000 c.ft. means £14,855 saving to the consumers, and, in consideration of the reduction, the shareholders are entitled to divide between them £1346, so you see that in a reduction in price the benefit to the consumer is eleven times that to the shareholder. I mention the reduction in the price of gas and its result first as it shows more clearly than anything else the stability of our Undertaking.

Another fact of great importance is that our capital expended has again decreased. Last year it stood at £461 per million c.ft. sold, and it is now £449 per million. When we remember the general depression during last year we shall be more than usually grateful that we have been able during that trying period to improve our position.

Turning to the accounts, you see that during the year we raised £150,000 of 5½ p.ct. irredeemable preference stock on which we obtained £6833 premium. In July, 1930, we raised £200,000 5 p.ct. redeemable mortgages at 97 p.ct., and have written off the discount thereon. It speaks well for the financial strength of the Company that the last £350,000 we have raised costs us only £5 2s. 2d. p.ct. per annum. On July 1 last we redeemed £98,695 of 7½ p.ct. redeemable mortgages, the annual saving on this redemption being £2467. You will note that the capital account is in credit, but as the balance is invested in War Loan it is earning its own interest.

The net capital outlay on the electricity undertaking was £9533.

There is little to call your attention to in the revenue account, except that you will notice there is nothing placed to special purposes or renewals fund, whereas last year we were able to add to these funds nearly £25,000. I would, however, point out that in the £154,717 for repairs of works we have included a sum of £25,000 for special retort renewals. The contributions to co-partnership, pensions, and health funds, in all £31,791, show a small increase, and they are all funds which we are glad to see growing.

The expenditure on distribution was slightly higher in 1931 than in 1930.

INCREASED SALES OF GAS.

On the other side of the account, the receipts from gas show a slight increase in spite of reduction in price. We are very satisfied with the increase in the sales of gas of 2·61 p.ct. One feature of the increase—namely, 4·40 p.ct. in public lighting—is one on which we may well congratulate ourselves and our officials. You will, I am sure, agree that to hold practically 93 p.ct. of the whole of the public lighting, in spite of the competition of a highly efficient electrical undertaking, is greatly to the credit of our Engineer, Mr. H. C. Smith, and is a proof that gas as a lighting agent is very much alive.

Residuals show a decrease—coke and tar giving a slightly lower return. The bad spot is sulphate of ammonia, on the manufacture of which we lost £3205. We must get rid of our ammoniacal liquor, and the cheapest way is to manufacture sulphate, even at a loss. We are always trying to find some use for our ammonia other than producing sulphate and hope some day to succeed.

You will see from Account E that there is a handsome increase in the profit on the electricity side of our Undertaking. We had one special consumer who purchased over 800,000 units of electricity from us for use in the construction of the Finsbury Park Tube Extension. Now the Tube is practically complete this account is closed. In July your Directors abolished the minimum charge to the benefit of the consumers of electricity.

Turning to the profit and loss account, we are now paying more interest on redeemable mortgages owing to the larger amount; there was some relief in the year on account of the redemption of the 7½ p.ct. mortgages. The expenses of the new issue, £2227, and the cost of our Order to date, £513, have been charged in the accounts. War Loan has been written down to par at a cost of £3274. Income-tax is higher by £6000.

The final result is that after meeting all standing charges, paying full statutory dividends, and setting aside £25,000 for special renewals, we are able to add £3450 to our carry-forward, which stands at £54,439.

The reserve funds have all been increased by income accruing from investments, the total addition to the funds being £6856.

LIQUID ASSETS.

The liquid assets of the Company are good, as follows:

	£
Investments	276,388
Stocks of coal, &c.	84,937
Sundry debtors	204,988
Cash at bank and in hand	67,380
	£633,693

It will be noticed that a further £20,000 has been invested on account of the pension fund.

Our funds are well invested, and they show a very small depreciation. Our Deputy-Chairman, Mr. Bailey, is largely responsible for our investments, and we are grateful to him for his foresight, and for the interest and care he takes in this work.

We are very pleased with our new quarters here at Woodall House. We find the change from the High Road beneficial in every way, and the added accommodation was badly needed. We supply gas now to over half-a-million people, and, in addition, electricity to the population of Wood Green—some 55,000 people. One thing the staff tell us they appreciate highly is the fact that they can obtain an excellent meal at a reasonable price on the premises, and the garden is also a great attraction. We have been able to charge to revenue most of the cost of the alterations to the building. We have some five acres of undeveloped land, also extensive buildings we are not using. We now have very convenient and handsome offices, and when the site is fully developed the cost will be very reasonable indeed.

TOTTENHAM AND DISTRICT GAS ORDER, 1932.

The Order has not yet received the approval of Parliament, but it provides that the amalgamation sought shall be effective as from Jan. 1 last. The object of the Order is to acquire the Gas Undertakings of Hertford, Hoddesdon, and Ware. We are glad to report that the Order is now unopposed. The districts to be taken over are contiguous to one another and to our own district of Waltham. The area of supply will be considerably increased and now extends to 100 square miles. The terms arranged, and which you have approved, are satisfactory to all concerned.

WOOD GREEN ELECTRICITY.

You will possibly remember that after some negotiations with the Wood Green Council, this Company obtained an Act in 1913 taking over the Wood Green Electric Lighting Order, 1902, and have since then been the suppliers of electricity in that area. Under the terms of the Act the Wood Green Council could take back their powers by giving one year's notice after Jan. 1, 1928, on certain agreed terms. In 1926 this Company approached the Council and suggested we should continue to supply under the terms of the London Electricity Acts of 1925, the leading principle being that we should continue to supply until 1971, when the Undertaking would have been handed over clear of all capital outlay as expended at the commencement of the arrangement.

It is only right to say that the case was not entirely clear owing to the setting up of various Electricity Authorities who had to be consulted. Although this Company met the Council in 1926, and have since then sent them certain reminders, no further negotiations have taken place.

At the end of last year we were surprised to find that the North Metropolitan Electric Power Supply Company had made an application to Parliament to take over the powers to supply electricity in the Wood Green area. We do not think we have been quite fairly dealt with, as we have carried out the supply of electricity now for nearly twenty years in a satisfactory manner. This Company has lodged a Petition against the North Metropolitan Company's Bill.

As I have told you, we had a very successful year at Wood Green, and, in consequence, have reduced our price, and I believe our charge is now lower than that of the North Metropolitan Company for lighting. Our charge for power is not so low, but we feel that the lighting charge should not be so high in order that power may be supplied at a very low and sometimes an uneconomic rate. The charge for electric lighting is often ten times that for power. As you know, no such discrepancy is possible with gas; the policy of Parliament has always been that the small consumers should have fair and sometimes rather privileged treatment.

I am glad to tell you that the home purchase scheme, which I mentioned last year, is being taken advantage of by members of the staff and workpeople.

We are selling an enormous amount of gas apparatus, and various schemes for easy payment for water heaters, gas fires, gas irons, &c., are being fully appreciated. Last year our receipts for cash, credit, and hire-purchase sales of apparatus exceeded £80,000. One very satisfactory feature is that during

last year we fixed an additional 306 public lamps. We have added 3600 consumers during the year, making a total to date of 113,458.

Apprenticeship Scheme.

The apprenticeship scheme started in 1925 is firmly established. A number of those who started as apprentices are now assistant inspectors, and are fully justifying their appointment and training. We are satisfied we can only obtain efficient men in all our Departments by training them ourselves, and this we are doing to an increasing extent.

Gas for Motor Vehicles.

You have, doubtless, heard of the use of gas compressed in cylinders to take the place of petrol for the propulsion of heavy vehicles. During the war, gas was used for this purpose, but only in an elementary way. In Paris much progress has been made, and there are numbers of vehicles there running on compressed gas. I am sorry that I have been unable to visit Paris, but our Engineer, Mr. Smith, has done so, and given us a full report. This report states that the vehicles ran very well, and that the drivers preferred gas to petrol. We have consulted the authorities, and are obtaining cylinders for experimental purposes, and hope very shortly to have some of our own lorries running on our own gas. We at first thought that we should have to obtain cylinders and compressors from France, but I am glad to say that we can, and are, getting them here. I mention the use of gas for this purpose because the possibilities are great. I am told on good authority that if the buses of the London General Omnibus Company were run on gas, it would mean the carbonization of no less than 500,000 extra tons of coal—a matter of some national importance.

As a convenient figure to memorize, I may say that the gas produced from a ton of coal is equal to, approximately, 50 gallons of petrol.

We are part of an Industry of now over a hundred years' standing. Throughout this long period it has been conducted on sound business and commercial lines, and to-day we are doing more than ever in research work, and carbonize coal in the most effective and efficient way, and we have made great progress in modern methods of salesmanship and advertisement. I would like here to say that although by use of all the most up-to-date plant we from time to time have to reduce employment in certain directions, we are increasing employment on the district where more is done than ever before for the benefit and convenience of our consumers.

Our pension fund and co-partnership fund enable us to retire men with a reasonable competence, and the result is that, in spite of keeping up-to-date in every Department, we are not adding to the pathetic army of unemployed.

The Coal Mines Act.

I would like to refer for one moment to the Coal Mines Act, 1930. Part I. of this Act expires on Dec. 31, 1932, unless Parliament determines otherwise. I trust that the users of coal will not forget to object to the continuation of this Act; otherwise it may go on to the detriment of, I believe, both the coal owners and the coal users. The quota is, I think, thoroughly unsound, and I would like to repeat the remark that was quoted in "The Times" last week made by the Coal Mines Re-organization Commissioners:

> A quota system, in so far as it gives an artificial value to the intrinsically valueless and perpetuates part-time working, is the very antithesis of rationalization.

Do not let us fail to see that Parliament is fully advised of the unfortunate position in which the quota has placed our most efficient collieries.

Your Directors and the officials are fully alive to the necessity of making the most of our opportunities. I know we have on the staff a body of men who are well qualified and enthusiastic in their work, and I have every reason to suppose that the workmen are loyal and hard working, and realize more and more, year by year, the advantages of the co-partnership and pension funds as the beneficent results are increasingly manifest.

With regard to the future of our Industry, and our own Undertaking, we have no reason for dissatisfaction. This Company, in spite of the mild weather and general depression, has since the beginning of this year kept up its output. We are daily connecting up new consumers, and our sale of apparatus is increasing. Should the improvement in trade we are all hoping for take place the outlook is promising.

The Chairman then moved:

> That the Report of the Directors and Statement of Accounts for the year to 31st December, 1931, be received and adopted, and that the Report be entered on the Minutes of the Proceedings of this day.

The Deputy-Chairman (Mr. Henry Bailey) seconded the resolution, and there being no response to the Chairman's invitation to shareholders to ask any questions regarding the report, the motion was put to the meeting and carried unanimously.

The Dividends.

The Deputy-Chairman thereafter moved:

> That a dividend at the rate of 5½ p.ct. and 5 p.ct. per annum respectively on the preference stocks, and £6 15s. p.ct. per annum on the ordinary stock, all less income-tax, be declared for the half-year ended Dec. 31, 1931, payable on March 1 next, and that the dividend warrants be sent to the proprietors by post.

He said that he did not think he could commend this resolution any further to them after they had heard the speech of the Chairman.

Mr. Arthur Edward Broadberry, M.Inst.C.E., seconded this motion, which was unanimously agreed to.

Re-Election of Directors.

The Chairman moved the re-election of Mr. Thomas Goulden, one of the retiring Directors of the Company. Mr. Goulden had been a Director of the Company now for many years and had been connected with the Gas Industry all his life, and what he did not know about gas was not worth knowing. They were very glad to have him on the Board.

Mr. William Alfred Surridge seconded the motion, which was carried.

Mr. Goulden, in acknowledging, said that he would continue to use his best endeavours to maintain their confidence.

The Deputy-Chairman then moved the re-election of Mr. Edward Corbet Woodall as a Director of the Company. Mr. Edward Woodall, he said, had been working with them for nearly twelve months, and they were glad to have him as a colleague. He had been well trained in the work, having spent some time on the works of the Bournemouth Gas and Water Company and was also a Director on the Board of another important company. He was a member of the Bar and an M.A. of Oxford University. His family had been connected with the Tottenham Company for 46 years. To his grandfather, the late Sir Corbet Woodall, they had been indebted for bringing it through times of difficulty in its earlier days, while it had for some years benefited by the leadership of his father, their present Chairman; and he hoped the family would continue to contribute to the prosperity of their business.

Mr. Surridge, in seconding, said that he had known Mr. Edward Woodall from his boyhood, and he took a keen interest in gas, not unnaturally for one bearing his name.

The resolution was carried unanimously, and in acknowledging,

Mr. Edward Woodall thanked them very heartily for the very kind way in which they had accepted the resolution for his re-election. He had been a Director of the Company now for nearly a year, and he was beginning gradually to realize what an excellent Company it was, and he felt it a great honour and privilege to be on the Board. He was well aware that it was not any particular merit of his own which brought him to this position, but that in honouring him they were honouring the members of his family who had gone before. It would always be his care to carry on the traditions which his family had settled on the Company for nearly fifty years.

Re-Election of Auditor.

Mr. F. R. W. Sly, in moving the re-election of Mr. William Cash, Junr., as an Auditor of the Company, congratulated the Company on the new offices at Woodall House, referring to the excellent acoustic properties of the room in which they were holding their meeting.

This resolution was seconded and carried unanimously, Mr. Cash acknowledging this evidence of their renewed confidence.

Votes of Thanks.

Major Garland said that he had a pleasing duty to perform in proposing the best thanks of the proprietors to the Chairman, Directors, and Auditors, and also to the officers, staffs, and workmen of the Company for their services during the past year. He also referred to the amenities of Woodall House, providing as they did very fine conditions for the officers and staff. They were wonderful premises, and whoever conceived the idea of providing them should be congratulated. He did not know whether the shareholders fully appreciated what the Directors had done for them and the wonderful services of Mr. Fussell and Mr. Smith; they were excellent men, and the shareholders should be glad to know that their money was under their influence. They wished all prosperity to the Company, and hoped that the gentlemen on the Board would be spared for many years to carry on. It was very pleasing to find that in spite of the depression in trade this Company had not only paid an increased dividend, but had been able at the same time to reduce the price of gas. He had much pleasure in moving this vote of thanks.

Mr. F. Church said it gave him the greatest possible pleasure to second this resolution and endorse all that the previous speaker had said. He was sure they could not have a better Board of Directors.

The Chairman, in acknowledging the vote of thanks on behalf of himself and his colleagues, thanked the shareholders very much for their kindly expressions of appreciation. He would like to propose a hearty vote of thanks to the staff and workpeople of the Company. No company had a better staff or set of workpeople than they had, and the results that had been put before them that day could only be obtained by team work. What little they could do in the way of co-partnership, pensions, health, and house schemes for the benefit of their staff they did. He did not know to whom the credit for the original idea of these new premises belonged, but they were an enormous improvement on what they had before. The work carried out here would be better because of the better surroundings.

The Deputy-Chairman, seconding the vote of thanks to the staff and workpeople, said that he was glad they had so excellent a staff, and they had great satisfaction in the work they did.

Mr. H. C. Smith (Chief Engineer), replying on behalf of the engineering staff to the expression of thanks, said that in times

similar to those through which they were passing now, when there was a general depression in trade, they were able to appreciate the very great advantage of being engaged in an undertaking which manufactured and supplied a commodity essential to the everyday life of every inhabitant in the district. The result was that the Directors were able to present a balance-sheet such as they had presented that day, and all of them would do their very best to ensure as good a balance-sheet at the end of the present year.

Mr. FUSSELL also replied to the vote of thanks, saying that his staff and himself endorsed all that had been said about Woodall House, because it had given them that freedom to carry on their work under the best possible conditions. The Chairman, he continued, had left unsaid two things in the course of his remarks. The first was that it was his (the Chairman's) birthday that day, and he was sure they would all desire to wish him "many happy returns of the day." The other thing was that this year Mr. Woodall celebrated his majority as a Director of the Company. He had been associated with the Tottenham Company for 21 years, and both the Company and Mr. Woodall were to be congratulated.

This terminated the business of the meeting.

Mid-Southern District Utility Company

ANNUAL MEETING

The Annual Meeting of the proprietors of the Mid-Southern District Utility Company was held at Farnborough on Thursday, Feb. 25, 1932—Mr. R. W. EDWARDS, J.P., C.C., Chairman and Managing Director, presiding.

The SECRETARY (Mr. F. A. RICKETTS) read the Notice convening the Meeting, and after the minutes of the previous Ordinary General Meeting and of the Extraordinary Meetings held on Dec. 10, 1931, had been confirmed, the CHAIRMAN rose to move the adoption of the Directors' Report and Accounts for 1931.

The Directors' Report was as follows:

The Directors present a statement of the Company's accounts for the year ended Dec. 31, 1931, from which it will be seen that the revenue from all departments was £276,381 13s. 9d., and the expenditure £212,109 11s. 1d., leaving a surplus of £64,272 2s. 8d.

After allowing for dividends on consolidated preference stock, interest paid to bank and on redeemable mortgage bonds and debenture stock, as well as for the statutory dividends paid for the half-year ended June 30, 1931, the Directors recommend the full statutory dividends of £6 1s. p.ct. per annum on the "A" stock; £4 11s. p.ct. per annum on the "B" stock; and £5 p.ct. per annum on the "C" stock for the latter half of the year, all less income-tax.

Gas, water, and electricity show better sales, and the outlook generally is quite good. Coke, breeze, and tar have had only moderate results, while sulphate of ammonia cost more to manufacture than its sale price.

Mr. Arthur E. Cutforth, F.C.A. (of Messrs. Deloitte, Plender, Griffiths, & Co.), retires by rotation and is willing to serve again if re-elected.

Mr. C. P. Crookenden, F.C.A., is the retiring Director, and, being eligible, offers himself for re-election.

R. W. EDWARDS, *Chairman.*

Feb. 4, 1932.

The Chairman's Address.

Addressing the proprietors, the CHAIRMAN said:

The report and accounts have now been in your possession for some days, and, with your permission, I propose to take them as read. This is the first time that they have been submitted to you under the new title conferred by Parliament in our 1931 Act. I would explain that this title is not that originally applied for; it is the product of additions put in by both Houses of Parliament. We are, however, making provision in our present Bill for the omission of one of the words, and as time progresses we hope Parliament will further abbreviate the name, which is far too cumbersome.

GAS.

In the past eight years the net sales of gas have advanced by 45 p.ct. For 1931, excluding our own consumptions, the total sales show an increase of about 3½ (3·46) p.ct., as against 2½ p.ct. for 1930; the increase in the consumption by ordinary meters being 4·6 p.ct. and that on automatic supplies 1·7 p.ct. This result, I think, may be considered very satisfactory, having regard to the peculiar and unseasonably mild weather and to the national financial depression, which reflects itself in the pockets of every gas consumer.

While, doubtless, my general statement will be accepted in regard to the peculiarities of the weather, I feel that it would not be inappropriate to point out that, apart from the acute diversities, there was deficiency from a sunshine point of view, inasmuch as the hours of sunshine during the year numbered only 1409, as against 1536·65 for 1930 and 1814·05 for 1929. Thus, you will see that, while 1930 was a poor year, 1931 was even worse; the daily sunshine average representing only 3·86 hours, as against 4·21 for 1930 and 4·97 in 1929.

Without exhausting your patience, I feel sure the following table of comparisons of monthly mean night temperatures for 1930 and 1931 will provide a useful study for those who take an interest in meteorological conditions. [See next column.]

—	1930.	1931.
	Fahr.	Fahr.
January	38·9	33·8
February	33·4	33·9
March	35·2	33·2
April	40·0	39·5
May	43·9	45·5
June	49·3	50·8
July	51·8	52·1
August	52·8	51·9
September	50·2	44·9
October	45·2	40·3
November	38·6	41·2
December	35·8	36·5
Average	42·925	41·966

These also prove that, although we thought 1930 a poor year, 1931 has been little, if any, better—six of the monthly figures being higher and six lower than in 1930—therefore, as I have already suggested, speaking broadly, there was very little to choose between the two years, and the modest increase mentioned above may be considered good in these days of trade depression.

The following apparatus was added during the year:

Cookers	485
Fires	728
Water heaters	378

The amount received from residuals represented 50·9 p.ct. of the cost of coal, as compared with 56·7 in 1930 and 60 p.ct. in 1929. While coke, breeze, and tar yields were but moderate, sulphate of ammonia, I regret to say, met with competition from an over-supplied market, a situation largely contributed to by the heavy production of synthetic nitrogen compounds and the limited purchasing power of agriculture. The yield in liquid products, calculating for ammoniacal liquor of 8 oz. strength, was 47·47 gallons per ton of coal carbonized, as compared with 47·4 gallons in 1930 and 47·86 gallons in 1929.

It is greatly to the credit of the Gas Industry as a whole that, year after year, steadily increasing sales are recorded, in the face of the most vigorous competition from electricity, and notwithstanding the unusually depressed markets for residuals. These adverse factors can be considered as reasonable commercial risks, but, in contrast to them, the out-of-date limitations imposed by statute sixty to eighty years ago are felt to be reasonable no longer.

Our own private Acts have placed us in a comparatively favourable position, but the Industry generally is crying out for less rigid restriction. Wide powers of co-operation among undertakers and more up-to-date methods of charge would open paths to increased general efficiency.

To pave the way for the necessary legislation on these matters, a Committee, of which I have the honour to be a member, was set up last year by the Board of Trade, and it is hoped that its forthcoming report will be followed by suitable Parliamentary action. The natural vigour of the Industry should ensure still greater progress in response to any liberation from the present out-of-date conditions.

WATER.

This department has been satisfactory. The plant has been well maintained, and extra expenditure has been incurred on the pumping machinery.

The total rainfall was 30·42 in., as against 28·93 in. for 1930 and 26·91 in. for 1929.

The average net domestic consumption per head per day was 12·96 gallons, as compared with 14·7 gallons in 1930 and 14·5 gallons in 1929, and it would not be fair to attribute the lower consumption entirely to the wet summer, as our inspectors deserve every credit for their excellent supervision.

ELECTRICITY.

This department is further developing, but owing to alterations and increases in areas served, comparative details are not shown in the accounts. We shall resume giving you the previous year's corresponding figures for this department in the course of a year or two when our acquisitions are consolidated.

The total advance in sales, excluding consumptions on our various works, amounts to nearly 33 (32·7) p.ct.

The following apparatus has been fixed during the past year:

Lamps	11,590
Motors	75
Fires	628
Cooking apparatus	151
Sweepers	87
Irons	192
Miscellaneous	148

representing an additional load of 2280 KW., as compared with an increase of 1533 KW. in 1930 and 623 KW. in 1929.

Further reductions in certain rates took place during the year, but since the introduction of the "Grid" supplies it has been necessary to revise and increase, from Christmas last, our charges for non-domestic purposes other than lighting.

We have a heavy programme in front of us with regard to the development of electricity, and during the next five years this department should claim a place among the leading electricity supply undertakings in the South.

CAPITAL.

For the three undertakings, the amount of capital authorized is £1,671,367 14s. 2d. Of this sum there has been received £1,133,340 5s. 7d. Adding a debit balance of £54,459 12s. 11d., we arrive at a total of £1,187,999 18s. 6d., from which £40,989 8s. 3d. (added on consolidation in 1909) is deducted to arrive at a net figure of £1,147,010 10s. 3d. After deducting depreciations of £16,193 9s. 2d., the net capital expenditure during the year was £41,461 19s.

GENERAL.

During the year, we have added 2550 consumers, including the latest absorption, making a net increase of about 14,000 (13,988) in eight years.

Co-partnership continues to be a satisfactory scheme. The the year ended June 30, 1931, the bonus was 7·7 p.ct., as against 8·3 p.ct. for the year ended June 30, 1930. The Sports Club and the Hospital and Benevolent Fund, in conjunction with the various Hospitals and Convalescent Homes, have done excellent work during the year, respectively for the recreation of the employees and the relief of those who have been ill or injured.

The Directors pay full tribute to the principal officers—the Chief Engineer, Secretary, Chief Accountant, and Solicitor—and to all officials and employees respectively under them for the devotion and zeal which has been given to the Company in the execution of their duties. Generally, the outlook is good, for the Company is fortunate in having a wide area for the development of business.

In conclusion, I now move the following resolution, which I will ask the Deputy-Chairman, Mr. T. A. BRADDOCK, to second:

> That the Directors' report, with the statement of accounts for the twelve months ended Dec. 31, 1931, be and are hereby adopted, and that the dividends as therein recommended be and are hereby declared to be payable to the proprietors on March 1.

The resolution was unanimously passed.

Mr. C. P. Crookenden, F.C.A., was re-elected a Director of the Company, and Mr. Arthur E. Cutforth, F.C.A., was re-appointed an Auditor, and the proceedings terminated with a vote of thanks to the Chairman, Directors, and staff.

Gas Companies' Results in 1931

Altrincham.

The Annual General Meeting of the shareholders of the Altrincham Gas Company was held at the Company's offices, Cross Street. In the absence of the Chairman of the Directors (Mr. W. W. Baker) the meeting was presided over by Mr. C. H. Syers (Deputy Chairman). Moving the adoption of the report and accounts, Mr. Syers said that during last year the sale of gas amounted to 429,862,300, an increase of 6,830,900, or 1·61 p.ct. over 1930. The decrease in industrial consumption was 8,021,000 c.ft., and this was more than made up by the increase in domestic consumption of 13,091,300 c.ft. and public lighting of 1,760,600 c.ft. Their miles of mains at 83 showed an increase of 3 miles, and their consumers showed a still further increase of 553, making the total 12,255. The number of public lamps had further increased and now totalled 2081. Again there had been a large demand for gas appliances of all kinds, the number sold during 1931 being 2908, as against 3076 for 1930, a decrease of 168. Referring to the capital account, the Chairman went on to say that they had raised by the sale of further share capital and the issue of mortgage bonds £12,041, and expended £9118 partly on the installation of the "Dri-gas" plant and the remainder on a normal increase in their mains. They had depreciated their meters and stoves by a further £1000 and carried forward unexpended capital of £5036. A resolution was passed that the full statutory dividend be paid on the share capital of the Company. At an Extraordinary Meeting of shareholders, which followed, the Directors were empowered to borrow £4422 for further extensions, and it was also unanimously agreed that the Directors be authorized to apply to the Board of Trade for further borrowing powers in accordance with Section I. of the Gas Regulation Act, 1929.

Andover.

At the Annual Meeting of Andover Lighting and Power Company the shareholders heard that the price of gas is to be lowered and that, in spite of a depressing year generally, the Company made an advance in business, and had no bad debts. Mr. W. Percival Clarke, Chairman of Directors, presided. The Chairman ran through the principal items of the accounts, from which it appeared that during the year 64,840,000 c.ft. of gas were made, an increase of 4,118,000 c.ft., and an additional sale of 3,118,000 c.ft., which represented an increase in output of 5·4 p.ct., and he thought all would agree that was most satisfactory. The increase in the amount of coal carbonized was 312 tons, which was due to the fact that there had been a larger amount of gas sent out. Coke sales had gone up to the extent of 168 tons, and they had a fairly steady market for it at a reasonably remunerative price. On the revenue account manufacture of gas cost £12,184; distribution, £4144; public lamps, £202; rents, rates, and taxes, £796; management, £992. The sum of £3203 was carried to profit and loss account. On the credit side of the sheet, gas sold realized £16,124; meters and stoves rentals were £2071; residual products brought in £3312. The general balance-sheet showed liabilities totalling £14,378. The assets were made up of cash at bank, £790; by stocks, £1048; persons for gas, meter, and stove rental, £2496; for residuals and fittings, £1663; by suspense account, £8500. The Chairman moved that for the half-year ended Dec. 31 last dividend be paid at the rate of 6 p.ct. per annum on the ordinary shares, and the preference stock (less income-tax), payable on March 1, and the same percentage for the half-year ending June 30 next to all shareholders.

Cambridge.

In 1931 the Cambridge University and Town Gas Light Company increased their sale of gas by 26 million c.ft. New consumers numbered 767. These were two of the satisfactory features revealed at the General Meeting of the Company at the Sidney Street Offices. The transfer to the Company of the gas undertaking at Cottenham was one of the powers desired under a Special Order which the Board of Trade was asked to grant by a special meeting of the Company. Mr. J. F. Cameron (Chairman) presided, and stated that in the revenue account there were increases in the cost of the coal carbonized, and in the receipts for the sale of gas and coke. Those increases all corresponded with the increase in the gas sold. In 1930 it was 844 million c.ft., and in 1931 870 million c.ft., an increase of 26 million c.ft. Their loss in the disposal of ammoniacal liquor had increased from £216 to £1404, the reason, of course, being that the bottom had fallen out of the ammonium sulphate market. The report was adopted, and a dividend for the half-year ended Dec. 31 was declared at the usual rate, less income-tax.

Chester.

The Annual Meeting of the Chester United Gas Company was held in the Board Room at the Company's Offices in Northgate Street. The Chairman (Sir John Frost) presided. The Secretary (Mr. Harry Hopkinson) read the dividend scheme and report of the Directors as follows: By balance to credit of profit and loss account after providing for interest on loan capital and dividend on preferential stock on Dec. 31, 1931, as shown in the published statement of accounts made up to that date and duly audited and certified, £14,079; full basic dividend on £157,150 ordinary stock of the Company for the half-year ended Dec. 31, 1931, at 2½ p.ct., will absorb £3928; increased dividend in respect of the selling price of gas during the year 1931 having been below the basic price as certified by the Company's auditors, at the rate of ¾ p.ct. on £157,150 ordinary stock, £1178, and transfer to reserve fund account, making a total extra appropriation of a like amount as that placed to co-partnership fund £253, now £1431, making £5360, and leaving a balance to carry forward to next year of £8719. Moving the adoption of the report and accounts, the Chairman said: On receipts side of revenue account, we have an increase from sales of gas of £550, representing an additional output of 4 million c.ft. of gas. The increase in the first half of the year was very substantial. In the latter half of the year, however, the increase did not continue, and remembering weather conditions, it was not surprising. The total revenue expenditure is £1140 more than in 1930, and the receipts are £1300 less, the balance carried to net revenue account being, therefore, £2400 below the previous year.

Dorchester.

The Annual General Meeting of the Dorchester Gas and Coke Company was held at the Gas Offices, Icen Way, Mr. J. Whittle Fudge (Chairman) presiding. The following report for the year was submitted: The sales of gas during the past year constitute a record, there being an increase of no less than 30,591 therms, or 6,798,000 c.ft., equal to 9 p.ct., which, having regard to the mildness of the weather preceding Christmas, is most gratifying, and the Directors desire to congratulate the shareholders on the continued expansion of the Company's business. The additional gasholder referred to in the last report has recently been completed and is now in use, and has been found to be of great advantage. The Chairman, in moving the adoption of the report, mentioned that during the year 106 gas cookers, 70 gas fires, 14 wash boilers, 6 radiators, 6 geysers had been fitted, and 100 new service connections made, proving the continued popularity of gas, both for cooking and heating and other purposes, and in

order to further popularize the use of gas the Chairman made the pleasing announcement that the Directors had decided to reduce the price of gas (subject to the usual scale of discounts) from 10·66d. per therm to 10·22d. per therm, or 2d. per 1000 c.ft., thus making the price 3s. 10d. per 1000 c.ft., this reduction being retrospective, dating from the reading of the meters at the close of the Christmas quarter. The usual dividends were declared.

Harrogate.

Moving the adoption of the report and accounts at the Annual Meeting of the Harrogate Gas Company, the Chairman (Mr. Francis Barber) said: As I omitted to draw your attention to it last year, I would have you note that our total capital expenditure had then just passed the half-million—viz., £508,039—and is now in the eighty-fifth year of the Company's existence £512,743. It may also be of interest, by way of comparison, to know that our sister service, the Harrogate Electricity Undertaking, had in the same year passed that amount—viz., £540,534—though it had only been in existence 34 years. Our capital expenditure during the year was £5047. It covers 3 miles of mains; a new telescopic holder at Tadcaster, where the consumption had increased since we took over the works there from 9,660,000 c.ft. to 12,631,700 c.ft., and meters for 472 new consumers. There is a profit on revenue account for the year of £32,237, against £29,485 in the previous year. The increase of £2751 in our profit is due to a reduction of £3004 in our expenditure, less a reduction of £252 in our receipts. This favourable result has been greatly helped by even further improvement in carbonizing results and reduction of loss on ammoniacal liquor. There has again been an increase both in the yield of gas per ton of coal and in its calorific value. The net cost of gas in the holders has been 14·27d. per 1000 c.ft., against 15·25d. Our Distribution Department is also entitled to credit for their further contribution to the result, our unaccounted-for gas having been further reduced to 4·59 p.ct., against 5·3 p.ct. in the previous year. The total receipts are down by £252. This is made up of a reduction in the sales of gas of £1306, less a total increase of £1054 in the other credit items. Our sales of gas are down less than 1 p.ct. (0·93 p.ct.). It was resolved that a dividend on the consolidated stock of the Company at the statutory rate of 10 p.ct. per annum, less tax, be declared and that the same be paid, less 5 p.ct. interim dividend paid on Sept. 1 last.

Hartlepool.

The heavy burden in rates and taxes and the continued industrial depression were points emphasized by Mr. Stanley Appleby, the Chairman, at the Annual Meeting of the Hartlepool Gas and Water Company. The profit for the year was £27,260, which, together with a sum of £23,673 brought forward from last year, made a total of £50,933. After paying an interim dividend of 2½ p.ct., less income-tax, there was an available balance of £36,750, out of which the Directors declared a final dividend of 2½ p.ct., less income-tax (making 5 p.ct. for the year), absorbing £13,267, and leaving a balance of £23,483 to carry forward to next account. The capital expended during the year, said the Chairman, has increased by £13,807, all accounted for by the necessary extensions of the Company's business. On the gas revenue account the total expenditure is lower than last year by £3770. The expense of the manufacture of gas, that is actually inside the works premises, is lower by £4254, but the distributing expenses are slightly higher. Rates and taxes are up by £1274, and together represent over one-seventh of our total expenditure. Consumers may well ponder this and remember that from every £1 in their gas bills, no less than 3s. 3d. is required for rates and taxes. On the income side the total receipts are down by £10,585, being made up chiefly by gas and public lighting, which were lower by £6604, and residuals, which were lower by £4174. Another item of expenditure which is higher is repairs of meters, mains, and services, which is £4986, as against £3746 last year, the difference being entirely due to the expense we were called upon to bear in the renewal of mains before their useful life was completed, owing to a programme of concreting of back streets by the local authority. Reference was made to the deaths of two Directors in Sir Frank Brown and Mr. T. H. Tilly. Only one vacancy was filled, and Mr. W. Ropner, the well-known shipowner, was appointed to the position.

Ipswich.

The Annual Meeting of the shareholders of the Ipswich Gas Light Company was held on Wednesday, Feb. 17—Mr. Henry Woodall (Chairman) presiding. Presenting the annual report and balance-sheet, Mr. Woodall said that although 1931 would be remembered as a year of general trade depression, he was pleased to report an increase in the sale of gas at Ipswich, Felixstowe, and Woodbridge. When they bore in mind the abnormally mild weather experienced at the beginning and end of last year, also the wet summer which largely spoilt the season at Felixstowe, these increases were undoubtedly a tribute to the soundness of their undertaking. The increase at Woodbridge was particularly satisfactory, being no less than 11·3 p.ct. There was a total increase in the quantity of gas sold of 7,681,000 c.ft. They were also able to record an increase in the number of consumers throughout their areas of 751, making the present total number 29,769. Their total receipts were £202,828, and their working expenses £182,118, leaving a balance of £20,710, which was carried to the profit and loss account. The net result of working for the year showed an available balance of £25,647, and after paying the dividends at the maximum rates the carry forward to next year would be £17,961—a slight increase over 1930. Their reserve fund, special purposes fund, and renewal fund represented reserves of £55,000, of which £44,000 was invested; and they had a cash balance of £16,000. Such a result as they were able to put before them could only have been obtained by the loyal co-operation of all concerned. The report was adopted, and dividends at the rate of £6 7s. 6d. p.ct. on the consolidated stock, 5 p.ct. on the redeemable stock, 5 p.ct. on the 5 p.ct. preference stock, and 7 p.ct. on the 7 p.ct. redeemable preference stock were agreed to. At an extraordinary meeting the Directors were authorized to issue on such terms and conditions as they might determine, £25,000 5 p.ct. redeemable debenture stock for the purpose of providing substituted stock in the place of the 5 p.ct. redeemable stock and the 7 p.ct. redeemable preference stock, which stocks are to be redeemed during the present year.

Liverpool.

The Deputy-Chairman (Mr. Alfred Tyrer) presided in the absence through ill-health of the Chairman (Sir Henry Wade Deacon) at the Annual Meeting of the Liverpool Gas Company. Moving the adoption of the report and accounts, the Deputy-Chairman said: During the year we have increased the number of gas cookers, gas fires, &c., on simple hire by over 8000, and we have sold outright or on hire purchase over 5000, and there is no doubt that when trade revival comes our gas sales will materially improve. The demand for our new smokeless fuel "Dryco" is satisfactory. Turning now to the accounts for the year, you will observe considerable alteration in the statements of loan and share capital "A" and "B." On June 30, 1931, we redeemed £600,000 7 p.ct. redeemable preference stock, and subsequently issued £245,500 redeemable 5 p.ct. preference stock, thus causing a considerable saving in interest. The total income of the Company for 1931 was £1,416,856, and, after deducting expenditure, we have a balance of £189,360 to carry to net revenue account. The net revenue account shows, after providing for final dividends due on the preference stock, and paying a half-year's interim dividend on the ordinary stock, together with the interest on debenture stock and mortgages for the year, there is a balance of £157,849. A dividend was declared for the half-year ended Dec. 31, 1931, of 3 p.ct. on the ordinary stock of the Company, less income-tax, leaving to be carried forward a balance of £93,473.

Maidstone.

The accounts of the Maidstone Gas Company for the year show that after providing for all fixed charges (including £2000 for depreciation of meters, stoves, and fittings, and £1831 for the renewal fund) there remains an available balance of £20,496, which, together with the balance of £13,229 brought forward from the previous year, and £236 interest on investments, makes a total of £33,962. The sum of £1140 has been transferred to reserve fund, bringing the total of that fund up to £19,527. Income-tax, interest on debenture stock and deposits, together amount to £8469. The Directors now recommend that a dividend of 9 p.ct. be paid for the year, less tax, subject to the interim dividend of 4 p.ct., less tax. A reduction in the price of gas from 11·8d. per therm to 11d. per therm was made on March 31, 1931, to consumers in the parishes of Sutton Valence, Harrietsham, Lenham, &c. A further all-round reduction in price of 0·2d. per therm was made as from the readings of the meters for the September quarter, 1931. The Company has entered into an agreement to buy gas in bulk from the Rochester, Chatham, and Gillingham Gas Company, for a term of twenty-one years in order to give a supply of gas to the Bridgewood Estate on the Maidstone-Rochester Road, which is not at present served by the Company's mains.

Malton.

The Malton Gas Company has earned a profit of £2190, against £2265 for the corresponding period last year. This is considered satisfactory in view of a decreased consumption of 6540 therms, chiefly due to the stoppage in gas-making during the flood period in early September, and also to the mild weather in December. The receipts for coke, tar, and asphalting have been well maintained, but the fittings show a decrease on the period of twelve months ago. After paying income-tax and interest on mortgage bonds, there is a balance of £6168 available for the payment of dividends. Owing to the increased demand for income-tax, the Directors have, due to the operation of the sliding scale, to reduce the dividend, and they recommend that a payment of 6 p.ct., free of income-tax, be made for the half-year. This will absorb £1440 and leave a balance of £4728 to be carried to the next account, as against the sum of £4358 brought into this account.

Newcastle-upon-Tyne.

In moving the adoption of the Directors' report and statement of accounts of the Newcastle-upon-Tyne and Gateshead Gas Company, the Chairman, Mr. J. E. Cowen, J.P., said: The expenditure during the year on capital account for buildings, plant and machinery, new mains, meters, and stoves, less the sale of a small piece of property at North Shields, has been £41,323. The cost of manufacture of gas shows an increase of £13,632. During the year a large sum has been expended on the reconstruction of retort plant at Elswick, which more than accounts for the increase. The total cost of distribution at £282,240 represents an increase of £2640. Turning to the income side, the receipts from gas show an increase of £2258. As a result of our attractive tariff charges and the activities of our new Industrial Department, sales have been secured for processes on which gas has not previously been used. From one firm we have secured an order for a new process which will mean a consumption of about 200,000 therms per annum; from

another 120,000 therms; another firm has converted the whole of its heat-treatment furnaces from coal and oil to gas, representing in normal times a consumption of about 50,000 therms per annum. Gas furnaces have also been installed for heavy forging, and the results have been so satisfactory that when trade revives the annual consumption for this purpose by a single firm is likely to be about 200,000 therms. In the heating processes required in the manufacture of the new Armstrong-Saurer motor lorries gas is used exclusively. Residuals show a decreased yield of £6352. The result of our operations is that we are in a position to pay the same dividend as in the two previous years—namely, at the rate of £5 7s. 6d. p.ct. per annum on the ordinary stock, of which £2 10s. p.ct. was paid as an interim dividend in August last. Owing, however, to the special items of expenditure to which I have already referred, the amount to be carried forward shows a decrease of £10,770. Our reserve, special purposes, and renewals funds amount in total to £206,318, of which £139,389 is invested outside the Company. You will notice that we have no money borrowed on temporary loans or from our banks, but that on the contrary we have over £28,700 in cash. We have increased our number of consumers during the year by 3300, making the total 197,180. Our public lamps have increased by 633, making a total of 23,611, which shows that the public authorities in this district rightly appreciate the merits of gas for public lighting. During the year we have had net increases of 7400 cookers, 5000 fires, 5000 wash-boilers and set pot burners, 2000 gas rings, grills, irons, and pokers, and 1000 appliances for commercial and industrial premises. We have also supplied over 42,000 lighting burners and 39,000 lighting fittings. These numbers are all larger than for the previous year.

Peterborough.

The Directors of the Peterborough Gas Company submitted the following statement for the year ended Dec. 31, 1931, at the Annual Meeting held on Feb. 16. Interim dividends of 5 p.ct. per annum on the new preference "A" shares and 7½ p.ct. per annum on the consolidated ordinary stock, both less income-tax, were paid in August last for the half-year to June 30, 1931, and the directors recommended the payment of dividends at the same rates, less income-tax, for the half-year ended Dec. 31, 1931. The payment of such dividends absorbed the sum of £3299, leaving a balance of £7307, which the Directors recommended should remain at the credit of the profit and loss account. It was reported that notwithstanding the acute depression in trade, which was more or less general throughout the year, the quantity of gas sold was 4,356,000 c.ft. in excess of the previous year, which represents an increase of 1·51 p.ct. The number of consumers shows a satisfactory increase of 406 for the year, and there are now 9288 cookers in use in the Company's area of supply.

Pudsey.

The sales of gas by the Pudsey Gas Company show a decrease of 3·67 p.ct. when compared with the previous year. Residuals are still a falling market, tar and sulphate of ammonia being especially bad; coke is the only product showing any signs of stability. The balance of net profit, after deducting the interim dividend at the rate of 9 p.ct. per annum, amounts to the sum of £12,513, from which the Directors recommend a dividend for the past half-year at the rate of 9 p.ct. per annum.

Scarborough.

The Annual Meeting of the Scarborough Gas Company was held at the Company's Offices, the Chairman, Mr. W. S. Rowntree, presiding. The Chairman, in moving the adoption of the report of the Directors and the statement of accounts, said: It is very satisfactory to be able to report continued increase in the sale of gas, which last year reached the record of 661 million c.ft., an increase of nearly 11 million c.ft. The sale and supply of new appliances during the year has again been most satisfactory, the outstanding feature being the sale of 656 high-grade enamelled cookers, everyone of which I am informed is giving complete satisfaction. We also supplied 907 fires, 413 washing coppers, and 701 water heaters. The number of gas meters in use is rapidly approaching 15,000, and at a conservative estimate there are now in use in Scarborough and district at least 12,000 gas cookers, 11,000 gas fires and radiators, 7000 washing coppers and water heaters, and innumerable other gas appliances of various descriptions. The amount of capital expended per 1000 c.ft. sold is now standing at the low figure of 12s. 3d., as compared with 12s. 5d. in 1930 and 13s. 3d. ten years ago. The gross profit carried to net revenue is £28,921, as compared with £27,508 for 1930. After allowing for the interim dividend paid in August last and the interest charges, &c., the balance of net revenue is £13,743. The Chairman moved that the statutory dividends (less income-tax) of 5 p.ct. per annum on the preference stocks and 6 p.ct. per annum on the ordinary stocks be declared; on account of which the statutory interim dividend of 2½ p.ct. for the half-year ended June 30, 1931, was paid on all classes of stock, and the remaining 2½ p.ct. on the preference stocks and 3½ p.ct. on the ordinary stocks for the half-year ended Dec. 31, 1931, to be payable on and after Feb. 26.

Shotley Bridge.

Sales of gas for the year by the Shotley Bridge and Consett Gas Company were 92,750,800 c.ft., an increase of 0·07 p.ct. as compared with the previous year. It has been decided to pay a half-yearly dividend on the 6½ p.ct. redeemable preference stock requiring £8333 and a final dividend on the consolidated stock of 5 p.ct. requiring £1525; while interim dividends on the

ordinary and preference stocks already paid absorbed £2358, leaving to be carried forward £548.

South Shields.

In moving the annual report and accounts of the South Shields Gas Company, the Chairman, Mr. Thomas W. Wallis, said: Despite adverse conditions it is pleasing to be able to report that the sale of gas for the period under review shows only a slight decrease of 1·06 p.ct., as compared with the previous year. Regarding the revenue account, the income from the sale of gas amounts to £87,743, being a decrease of £744, as compared with the previous year, the decrease, of course, being due to the slight drop in consumption. There was a net increase of 142 consumers at the end of the year. The income from the sale of coke shows a decrease of £4847, as compared with the year 1930. The total cost under the heading of manufacture amounts to £57,555, against £60,934 for the previous year, a decrease of £3379. Distribution expenditure in the aggregate amounts to £22,229, as against £23,417 for the year 1930, a decrease of £1188. The income, as stated in the report, amounts to £125,690, and the expenditure to £104,801, leaving a profit for the year of £20,889, which I am pleased to state, is only £136 short of the full amount required to meet all our interest charges and the dividends.

Stamford.

Mr. James Ringham presided at the Annual Meeting of the Stamford and St. Martin's Gas Light and Coke Company, when the Directors reported that the result of the year's working had been a profit of £3585, and that the profit and loss account, after payment of the year's interest on mortgage, preference dividends, interim dividend on original stock, income-tax, &c., showed a balance of £4539 available for disposal. The Directors recommended the confirmation of the interim dividend of 5 p.ct. (actual), less tax, paid Sept. 1, 1931; the payment of a final dividend of 7 p.ct. (actual), less tax; and the carrying forward of the remaining balance of £3712 to the current year's account.

The Chairman commented that in spite of trade depression and a falling off in the industrial load, the sales of gas had been maintained, and, in fact, showed a slight increase. During the year there had been an increase of 117 consumers, and a satisfactory feature was the sales of gas-consuming appliances, particularly high-grade cookers, fires, and coppers.

Wakefield.

The report of the Directors of the Wakefield Gaslight Company states that the consumption of gas for the year is 331,122,500 c.ft.—a decrease compared with the previous year of 12,605,100 c.ft., or 3·66 p.ct. An interim dividend of £2 10s. p.ct. on the ordinary stock and £2 10s. p.ct. on the maximum stock, and the half-year's dividend of £2 5s. p.ct. on the preference stock, were paid on Sept. 1 last, and the balance now available for dividend is £7534. The Directors recommend that after paying the prescribed dividend on the 4½ p.ct. preference stock, further dividends be paid as follows: 4 p.ct. on the £130,000 of ordinary stock (making £6 10s. p.ct. for the year), £2 10s. p.ct. on the £81,650 of 5 p.ct. maximum stock (making 5 p.ct. for the year); and that the balance be carried to the next account.

Wolverhampton.

In presenting the accounts for the year ended Dec. 31 last, the Directors of the Wolverhapton Gas Company state that the gross profit for the year is £17,169, out of which has been paid £8816, interest on debenture stocks and pensions fund, the net profit being £8652. An interim half-year's dividend was paid in August last year at the following rates—viz., 3 p.ct. on the 6 p.ct. preference stock; £2 10s. p.ct. on the 5 p.ct. preference stock; and £3 10s. p.ct. on the consolidated ordinary stock; and the Directors recommend final dividends at the same rates for the half-year ended Dec. 31, 1931, in the case of the preference stocks, and at £4 10s. p.ct. on the consolidated ordinary stock. The Directors also recommend that £3787 be placed to the reserve fund.

Parliamentary Intelligence

[From Our Special Correspondents.]

House of Lords.

Special Orders.

The Darlington Gas Order and the Sedgley Gas Order, having been passed by the Special Orders Committee, have been approved by the House.

House of Commons.

Private Bills.

The second readings of the Commercial Gas Bill and of the Kettering Gas Bill have been deferred to Thursday, March 3.

The Scarborough Gas Bill has been passed by the Examiners, and stands referred to Group B Committee.

The *locus standi* of the South-Eastern Tar Distillers and the Society of British Gas Industries, as petitioners against the South Suburban Gas Bill, has been challenged, and referred to the Referees.

Smokeless Fuel.

Mr. PARKINSON asked the First Commissioner of Works if he would consider the desirability of using good quality coal in preference to what was now being used for heating in the libraries and corridors of the House of Commons.

Mr. ORMSBY-GORE said that the present experimental use of smokeless fuel, designed to encourage the use of low-temperature carbonization bye-products in Government buildings, was introduced by the late Labour Government. He was satisfied that the smokeless fuel now in use was an efficient heating agent, but he proposed to re-examine the whole question at the end of the present heating season.

Special Orders.

The Darlington Corporation Order and the Sedgley Urban District Council Order have been approved by the House.

Plans have been deposited in connection with the Newbury Corporation Gas Order.

Aviation Signs on Gasholders.

Mr. PERKINS asked the Under-Secretary for Air whether he would make representations to all gas undertakings in this country with a view to getting them to paint on the top of the gasholders when next repainted the name of the town in which they were situated.

Sir PHILIP SASSOON stated that the Air Minister did not consider that any special representations were called for at this juncture having regard to the official scheme of ground markings. He added, however, that the Air Ministry would welcome any voluntary action on the lines suggested as a supplement to this scheme, and would be prepared to give advice on the subject to any gas companies interested.

Mr. EVERARD called attention to the great success of this scheme in the County of Leicester, and suggested its extension throughout the country. He urged that the scheme of ground markings was a very expensive one, whereas the scheme of marked gasholders was comparatively cheap.

Mr. PERKINS pointed out that gasholders were repainted every year or every other year, and urged that gas companies should be asked to co-operate in such a scheme.

Sir PHILIP SASSOON replied that, while the Air Ministry would welcome a scheme of that kind, they did not think it would be advisable to give assistance to any other than the standard scheme of ground markings.

Legal Intelligence

Parent Coal Carbonization Trust, Ltd.

A petition for the winding up of the Parent Coal Carbonization Trust, Ltd., was before Mr. Justice Bennett in the Chancery Division on Monday, Feb. 15.

Mr. ALEXANDER GRANT, K.C. (for the Company), pressed for an adjournment. He remarked that the process worked by the Company was very efficient, and valuable negotiations were in progress. It was hoped that the scheme would go through, for it would result in the paying off of the unsecured creditors in full and provide the Company with further capital. One of the largest industrial concerns was interested in the project, added Mr. Grant, who stated that he also opposed the petition, acting as the representative of creditors for a very large sum.

In reply to the Judge, who asked what the nature of the scheme was, Mr. Grant observed that there also was a scheme by which the unsecured creditors should be treated *pari passu* with the debenture holders by the issue of debentures to those unsecured creditors. The debenture holders had consented to that suggestion.

The statement, however, was not accepted as accurate by Counsel for the petitioning creditors.

Mr. GRANT said the proposal was to transfer existing debentures to the creditors, and the advent of fresh capital was anticipated. The Company was an important one, and new processes had just come to fruition.

In the end, his Lordship ordered the matter to stand over for fourteen days, and directed the Company to give the petitioning creditors more information and to bring the matter again before the unsecured creditors.

The affairs of this concern were mentioned again to Mr. Justice Bennett in the Chancery Division on Monday.

Mr. ALEXANDER GRANT, K.C. (for the Company), stated that a scheme had been prepared which it was hoped would go through, and he asked that the petition should stand over until after the Easter Vacation.

There was no opposition to the application, Mr. Grant appearing also for creditors opposing the winding-up, and it was granted.

[For Market Reports, see p. 566.]

STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

[For Stock Market Report, see later pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Feb. 27. (Provincial Exchanges Feb. 26.)	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
1,551,868	Stk.	Oct. 5	7⅞	7⅞	Alliance & Dublin Ord. ...	103—108	...	105—107
374,000	,,	Jan. 4	4	4	Do. 4 p.c. Deb. ...	65—70	...	...
557,655	,,	Aug. 24	7	7	Barnet Ord. 7 p.c.	120—125	...	...
300,000	1	Oct. 19	1/9⅜	1/4⅜	Bombay, Ltd.	15/—17/6	...	16/6—16/10½
177,750	10	Aug. 10	9	9	Bournemouth 5 p.c. ...	14⅜—15⅜	...	...
500,050	10	,,	7	7	Do. B 7 p.c. ...	12—13	...	12½—12¾
439,160	10	,,	6	6	Do. Pref. 6 p.c. ...	10½—11½	...	...
50,000	Stk.	Dec. 14	3	3	Do. 3 p.c. Deb. ...	55—60	+2	...
162,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	75—80	+2	75½—78
210,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	95—100	+3	98—97¾
357,900	,,	Aug. 24	7½	7½	Brighton & Hove 6 p.c. Con.	114—119	...	116½
540,000	,,	,,	6¾	6¾	Do. 5 p.c. Con.	104—109	+1	105½
1,287,500	,,	July 23	5	5	Bristol 5 p.c. max.	90—92[a]	...	...
120,420	,,	Jan. 4	4	4	Do. 1st 4 p.c. Deb. ...	77—79[a]	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	77—79[a]	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	97—98[a]	...	...
855,000	,,	Oct. 5	8	7	British Ord.	108—113	...	...
100,000	,,	Jan. 4	7	7	Do. 7 p.c. Pref.	110—115	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	70—75	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	90—95	...	...
160,000	,,	Jan. 4	5	5	Cambridge 5 p.c. Deb. ...	90—95	...	...
100,000	10	Nov. 30	8	6	Cape Town, Ltd.	8½—9½	...	8⅝—8⅝
100,000	10	Oct. 30	4½	4½	Do. 4½ p.c. Pref. ...	6½—7½	...	...
150,000	Stk.	Jan. 4	4½	4½	Do. 4½ p.c. Deb. ...	65—70	...	...
626,860	,,	Feb. 15	6	6	Cardiff Con. Ord.	93—96[e]	...	...
237,860	,,	Jan. 4	2⅜	5	Do. 5 p.c. Red. Deb.	91—96	...	...
157,150	,,	Feb. 15	5	6½	Chester 5 p.c. Ord.	84½—89½[b]	...	...
98,936	1	Oct. 5	1/2/-	2/-	Colombo, Ltd. Ord.... ...	27/—32/-	...	...
24,500	1	,,	1/4⅛	1/4⅛	Do. 7 p.c. Pref.	17/—19/-	...	...
609,204	1	Oct. 19	1/3'27	-/10'90	Colonial Gas Assn. Ltd. Ord.	10/—15/-	...	...
296,053	1	,,	1/5'67	1/2'54	Do. 8 p.c. Pref.	10/—15/-	...	...
2,073,280	Stk.	Feb. 15	6	5⅝	Commercial Ord.	92½—95½[c]	...	92—94
475,000	,,	Dec. 14	3	3	Do. 3 p.c. Deb. ...	51—56	...	54—55
807,560	,,	Feb. 15	7	7	Croydon sliding scale	105—108[a]	...	108
469,590	,,	,,	5	5	Do. max. div.	80—83[a]	...	...
542,270	,,	Aug. 24	10	7	Derby Con.	120—125[c]	...	...
55,000	,,	Jan. 4	4	4	Do. Deb.	65—70[c]	...	...
209,000	,,	Sept. 7	5	5	East Hull Ord. 5 p.c. ...	71—76	...	...
179,500	,,	Aug. 24	5½	5½	East Surrey Ord. 5 p.c.	86—91	...	...
155,019	,,	Jan. 4	5	5	Do. 5 p.c. Deb. ...	90—95	...	...
1,002,180	,,	Sept. 21	16½	14	European, Ltd.	100—110	...	102—106
18,911,138	,,	Feb. 15	5⅝	5⅝	Gas Light & Coke 4 p.c. Ord.	18/9—19/9/*	+/3	19/—19/4½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max. ...	56—61[a]	+1	59—59½
4,294,691	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	74—77[a]	+2	75—76
6,102,497	,,	Dec. 14	3	3	Do. 3 p.c. Con. Deb. ...	58—61[a]	+1	59½—60
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	97—100	+1	100
2,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	87—90	+1	90
162,280	,,	Sept. 7	10	10	Harrogate Cons. 10 p.c. max.	157—162	...	...
82,500	,,	Aug. 24	7	7	Hastings & St. L. 5 p.c. Conv.	95—100	...	...
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	81—86	...	...
70,000	10	9 Oct. '30	‡	10	Hongkong & China, Ltd. ...	11—12	...	...
213,200	Stk.	Aug. 10	6	6	Hornsey Con. 3½ p.c. ...	89—92	...	...
2,800,000	,,	Oct. 30	25	15	Imperial Continental Cap.	340—360	...	345—353
223,130	,,	Feb. 1	3½	3½	Do. 3½ p.c. Red. Deb.	68—73[a]	...	70
235,242	,,	Aug. 10	8½	8½	Lea Bridge 5 p.c. Ord. ...	129—132	...	...
2,145,907	,,	Aug. 24	6	6	Liverpool 5 p.c. Ord. ...	98—98½[b]	+½	...
245,500	,,	,,	—	5	Do. 5 p.c. Red. Pref. ...	94—99[b]	...	...
306,083	,,	Jan. 15	4	4	Do. 4 p.c. Deb. ...	78—80[b]	...	...
165,736	,,	Feb. 15	8	10	Maidstone 5 p.c. Cap. ...	119—124[c]	...	...
56,176	,,	Jan. 4	3	3	Do. 3 p.c. Deb. ...	51—56	...	...
76,000	5	Nov. 30	†10	†10	Malta & Mediterranean ...	6½—7	...	...
392,000	—	Oct. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	78—83	...	...
171,978	Stk.	Aug. 24	5	5	M. S. D. Utility "C." Cons.	76—81	...	...
718,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	67—72	...	...
112,126	,,	,,	4	4	Do. 4 p.c. Deb. ...	70—75	...	...
148,955	,,	,,	5	5	Do. 5 p.c. Deb. ...	90—95	...	...
675,000	,,	May 21	†6	†6	Montevideo, Ltd.	70—80	...	...
2,061,315	,,	Aug. 10	5⅔	5	Newcastle & Gateshead Con.	16/6—17/6[d]/	+/1½	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	68—70[d]	...	...
691,705	,,	Jan. 4	3½	3½	Do. 3½ p.c. Deb. ...	67—68[d]	−1½	...
277,285	,,	Oct. 30	5	5	Do. 5 p.c. Red. Deb.	96—98[d]	...	...
199,940	,,	Aug. 24	7½	7½	North Middlesex 6 p.c. Con.	105—110	...	...
396,160	,,	Feb. 15	5	5	Northampton 5 p.c. max. ...	72—77[c]	...	...
300,000	,,	Nov. 30	7	9	Oriental, Ltd.	88—98	...	...
60,000	5	13 May, '15	—	—	Ottoman	0—½	...	...
205,162	Stk.	Jan. 4	8	8	Plym'th & Stonehouse 5 p.c.	113—118	−1	...
504,416	,,	Feb. 15	8	8	Portsm'th Con. Stk. 4 p.c. Std.	116—121[c]	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	74—77[c]	...	...
686,312	,,	Jan 18	4	4	Primitiva 4 p.c. Rd. Db. 1911	75—85	...	...
389,813	,,	Jan. 4	4	4	Do. 4 p.c. Cons. Deb.	75—85	...	...
150,000	10	Sept. 21	6	6	San Paulo 6 p.c. Pref. ...	7¼—7¾	...	...
1,786,968	Stk.	Sept. 7	6½	6	Sheffield Cons.	103—105[e]	...	...
95,000	,,	Jan. 18	4	4	Do. 4 p.c. Deb.	79—81[e]	...	...
133,201	,,	Sept. 7	5	8½	Shrewsbury 5 p.c. Ord. ...	90—95	...	...
90,000	10	June 11	†5	†5	South African	3—5	...	...
6,709,895	Stk.	Feb. 15	5	7	South Met. Ord.	97—100[c]	...	98⅛—99½
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	105—110[c]	+1	107—109
1,895,445	,,	Jan. 4	3	3	Do. 3 p.c. Deb. ...	57—60	+1	59⅔
1,000,000	,,	Jan. 18	4	5	Do. 5 p.c. Red. Deb.	96—101	+1	98—100½
91,500	,,	Aug. 10	8½	8½	South Shields Con.	120—125[d]	...	...
1,543,795	,,	Feb. 15	6½	6	South Suburban Ord. 5 p.c.	98—103[c]	...	...
668,837	,,	Jan. 4	5	5	Do. 5 p.c. Deb.	91—96	...	93⅔
647,740	,,	Aug. 24	5	5	Southampt'n Ord. 5 p.c. max.	77—80	...	...
121,275	,,	Jan. 4	4	4	Do. 4 p.c. Deb.	72—77	+2	75—76
250,000	,,	Aug. 24	7	7	Swansea 7 p.c. Red. Pref. ...	96—99	...	...
200,000	,,	Jan. 4	6½	6½	Do. 6½ p.c. Red. Deb.	98—101	...	...
1,076,490	,,	Aug. 10	6⅝	6⅝	Tottenham and District Ord.	103—107	...	...
300,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	95—100	+2	...
199,005	,,	Dec. 14	4	4	Do. 4 p.c. Deb. ...	71—76	...	...
85,701	,,	Sept. 21	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	72—77	...	...
346,069	,,	Aug. 24	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	102—107	...	...
88,390	,,	,,	5	5	Do. 5 p.c. Pref. ...	87—92	+2	...
1,322,220	,,	July 9	7	7	Wandsworth and District: Consolidated	112—116	...	114—115
971,373	,,	,,	5	5	Do. 5 p.c. Pref.	92—97	+2	94
1,167,964	,,	Jan. 4	5	5	Do. 5 p.c. Deb.	94—99	+1	96⅔

Quotations at:—*a*.—Bristol. *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. *f*.—The quotation is per £1 of stock. *g* The interest due 1/1/32 was paid on that date. * Ex. div. † Paid free of income-tax. ‡ For year. § Div. =10 p.ct. p.a. less tax and less tax on interim dividend.

(This announcement is inserted gratuitously.)

PETER—WITH ONE EXCEPTION

With one exception Peter is an ordinary little fellow. Chubby, likeable, just five-and-a-half, full of life and fun and on occasions—be it admitted—of naughtiness.

Just now Peter's rather important, for this is his first term at school, and he's grappling with the intricacies of "A B C" and "Twice Two": difficult subjects to all men of five-and-a-half, but even more difficult in Peter's case because—bad luck—he's totally blind. That's his One Exception.

Peter learns reading, writing, and 'rithmetic through the medium of "Braille"—dull stuff compared with the coloured picture books of most five-and-a-halfs. However, he's a stout lad is Peter, and he's making great progress.

Would you like to know more about him? How, in spite of his "One Exception," he is being educated, and, when older, technically trained and usefully employed.

There is a long waiting list of "Peters" throughout the British Isles, for whom training and accommodation must be provided in the immediate future.

Will you help with a donation or annual subscription? Any sum, large or small, will be gratefully received.

Here's a suggestion. Your eyesight is worth 3d. a year to you. Send Peter and his handicapped pals 3d. for every year you've had it. Now, please, in case it slips your memory. Good idea!

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GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see earlier page.]

The chief feature of last week's business on the Stock Exchange was the strength of the gilt-edged market. British Government securities and other first-class stocks were in great demand by investors both at home and abroad, and though prices have not yet reached last year's highest levels they have recovered a great deal of the loss sustained in September last when the Gold Standard was abandoned. The popularity of "safety-first" holdings is further evidenced by the colossal over-subscription to the Borough of Croydon's issue made during the week and to the fact that several other issues made a short time ago are now quoted at substantial premiums. On the more encouraging dividend announcements made during the week and the prospects of better trade under the change in the fiscal system, the Industrial section also showed some signs of improvement.

The prevailing demand for fixed-interest bearing securities also extended to the Gas section, and it will be seen from the Stock and Share List that no fewer than sixteen preference or debenture issues improved in value from 1 to 3 points, including all these stocks of the Gas Light and Coke and South Metropolitan companies. Among ordinary issues Gas Light and Newcastle £1 units both improved, the former by 3d. to 19s. 3d., the latter by 1½d. on the local exchange, and Liverpool 5 p.ct. hardened a fraction. The only two issues to show any depreciation were Newcastle 3½ p.ct. debenture by 1½ points to 67-68 and Plymouth and Stonehouse 5 p.ct. ordinary stock which dropped 1 point to 115½.

Among last week's dividend announcements for the past half-year were the following: Brighton and Hove £3 15s. p.ct. on the 6 p.ct. stock and £3 7s. 6d. p.ct. on the 5 p.ct. stock; East Hull £2 10s. p.ct.; Hastings and St. Leonards £3 10s. p.ct. on the 5 p.ct. stock and £2 15s. p.ct. on the 3½ p.ct. stock; and North Middlesex £3 15s. p.ct. In all cases similar rates were paid for the June half-year and the total distributions for the year the same as in 1930.

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *Feb.* 29.

There is little change in the values of tar products, which are as follows:

Pitch continues to advance in price, and it is reported that 95s. per ton f.o.b. has been made.

Creosote, for export, varies from 3¾d. to 5d. per gallon f.o.b., according to specification.

Pure toluole is about 2s. 9d. per gallon at makers' works; pure benzole, 1s. 8d. to 1s. 9d. per gallon; 95/160 solvent naphtha, about 1s. 5d. per gallon; and pyridine bases, about 3s. 9d. to 4s. per gallon.

Tar and Tar Products in the Provinces.

Feb. 29.

The average prices of gas-works products during the week were: Gas-works tar, 39s. to 44s. Pitch—East Coast, 80s. to 85s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 80s. to 85s. f.o.b.* Toluole, naked, North, 1s. 10½d. to 1s. 11d. Coal-tar crude naphtha, in bulk, North, 5d. to 5¼d. Solvent naphtha, naked, North, 1s. 3d. to 1s. 3½d. Heavy naphtha, North, 11d. to 11½d. Creosote, *ex* works, in bulk, North, liquid and salty, 3½d. to 3¾d.; low gravity, 1¾d.; Scotland, 3½d. to 3¾d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid, 60's, 1s. 7¼d. to 1s. 8d. Naphthalene, £9 to £10. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Feb.* 27.

Orders are not too plentiful, but values of most products continue firm. Refined tar is commanding considerable attention, and quotations show an increase over last week.

Pitch.—The export value is nominal at round 77s. 6d. to 80s. per ton f.o.b. Glasgow, while home business is being conducted at 80s. per ton *ex* works.

Refined tar to Ministry of Transport Specification is firmer at 4¼d. to 4½d. per gallon in buyers' packages at makers' works.

Creosote oil.—Market conditions are quiet but steady. B.E.S.A. Specification is 3d. to 3¼d. per gallon; low gravity, 3¼d. to 3¾d. per gallon; and neutral oil, 3¼d. to 3¾d. per gallon—all *ex* works in bulk.

Cresylic.—Little movement is noticeable, and prices are irregular. Pale, 97/99 p.ct., is 1s. 1½d. to 1s. 2½d. per gallon; dark, 97/99 p.ct., 1s. 0½d. to 1s. 1½d. per gallon; and pale, 99/100 p.ct., 1s. 3½d. to 1s. 4d. per gallon—all f.o.r. naked.

Crude naphtha.—The value is steady at 4½d. to 5d. per gallon f.o.r., according to quality.

Solvent naphtha is dull and uninteresting at 1s. 3d. to 1s. 4d. per gallon for 90/160 grade, and 1s. to 1s. 1d. per gallon for 90/190 grade.

Motor benzole.—Quotations are maintained at 1s. 3d. to 1s. 4d. per gallon f.o.r. in bulk, but orders are scarce.

Pyridines.—90/160 grade is 3s. to 3s. 3d. per gallon, and 90/140 grade 3s. 3d. to 3s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	7	to	0	7½	per gallon at works
Motor "	1	2	"	1	3	" " "
Pure "	1	6	"	1	7	" " "

Contracts Advertised To-Day.

Breeze Washing Plant.

The Oldham Corporation Gas-Works Committee invite tenders for the supply of coke breeze washing plant. [Advert. on p. 568.]

Boilers.

The Oldham Corporation Gas-Works Committee invite tenders for the supply of a new Lancashire boiler and removal of existing boiler to new position. [Advert. on p. 568.]

Steam Engine.

The Clonmel Corporation Gas Department invite tenders for the supply of a steam engine. [Advert. on p. 568.]

Trade Notes.

Coal Blending and Briquetting Plant.

The Gas Light and Coke Company have placed a contract with Messrs. Robert Dempster & Sons, Ltd., Rose Mount Iron Works, Elland, for a coal blending and briquetting plant for their Southall Works.

Stanton Ironworks Company, Ltd.

The Stanton Ironworks Company, Ltd., near Nottingham, have recently completed a new plant for the manufacture on mass production lines of standard specials of 3 in., 4 in., and 6 in. diameter sizes for use with cast-iron and centrifugally-made pipes. These special castings are being offered at a price substantially below present prevailing prices, and in finish and quality are superior to those produced by older methods of manufacture.

Gas Acts (1920 and 1929) Orders.

SPECIAL ORDERS.

Audley Urban District Council.

To provide that, notwithstanding anything in the Audley Gas Order, 1925, the Council may in any year pay out of the general rate and general rate fund of the Urban District of Audley the whole or any part of the sums (including payments by way of interest or contributions to any sinking fund) payable in such year, in respect of money borrowed under the provisions of the Audley Gas Order, 1925.

Newbury Corporation.

To extend the limits of supply, to empower the Corporation to acquire the undertaking of the Thatcham Gas Light and Coke Company, Ltd., to authorize the fixing of differential charges in the added limits, to sanction the use of scheduled lands for gas purposes, &c.

Oxford and District Gas Company.

To authorize the Company to raise additional capital, to extend the limits of supply, to authorize the use of additional lands for gas purposes, to make provisions as to gas prices, &c.

Overseas Opportunities.

The Municipal Authorities of Zurich, Switzerland, have just invited tenders for the construction of a new battery of retorts at the municipal gas-works at Schlieren capable of carbonizing 400 tons of coal per 24 hours.

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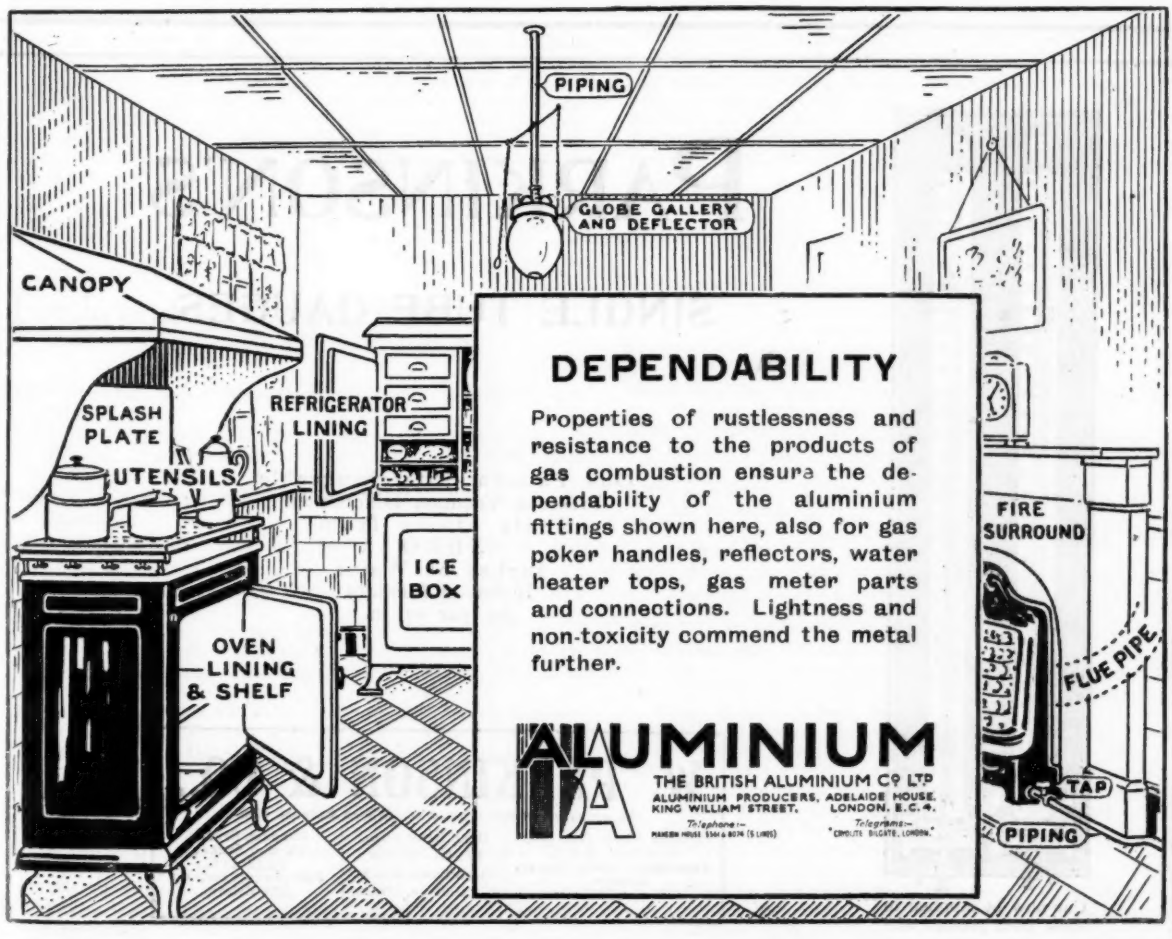
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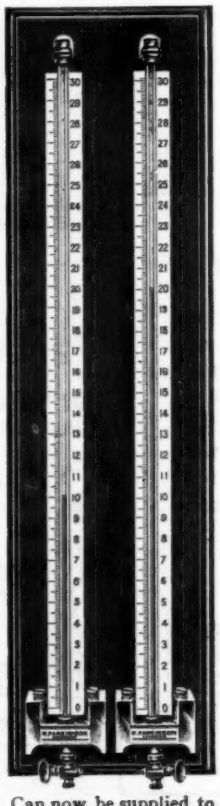

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